NEWS IN BRIEF

Satellites 'threat to staff'

A THREAT to administrative staff is posed by the use of communications satellites where they enable companies to set up one administration centre to handle worldwide information processing, according to Barrie Sherman, director of research at ASTMS.

Giving an example, Sherman says that a consortium of UK insurance companies has already carried out a feasibility study into this method, and may use it to handle work generated by their Australian offices.

More competition

YET another US company, Citel Corp, of Northbridge, California, has entered the market for plug-compatible mid-range IBM 370 CPUs. The first two offerings are called the 30XX Model 3, matching the 370/138, and the Model 4, matching the 148.

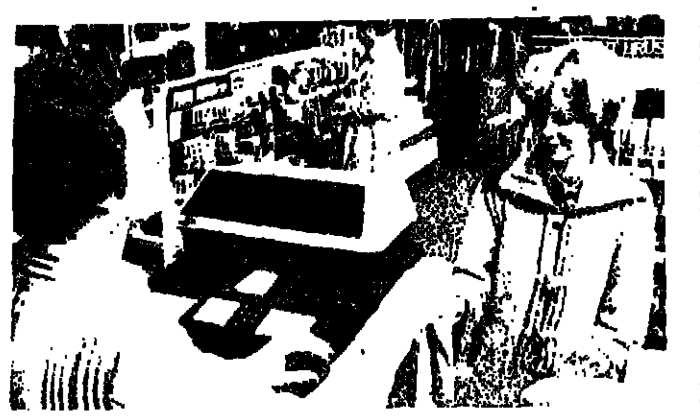
Cray in UK

TO support installations in the UK, Cray Research has set up a British subsidiary with Peter Appleton Jones as managing director. Cray systems so far announced in the UK include the 1 Megaword machine at the ECWF weather centre at Shinfield Park, Reading, and an interim half Mword system at the Atomic Weapons Research Establishment at Aldermaston, Berks (CW, April 20).

Ariel boss resigns

MANAGING director and one of the creators of the Digital Equipment PDP-11-based Ariel share-dealing system for financial institutions, Colin Leach, is resigning to become an executive director of Fidelity Management & Research (UK).

Store group £2m order for ICL 9500 terminals


DESIGNED for use in many retail environments, the ICL 9500 terminal in the picture is being used in a hardware store.

ONE of the first customers for ICL's new 9500 series of point-of-sale terminals is the Allders department store group which has placed a £2 million order for over 500 of the 9540 terminals and an ICL processor, as part of a PoS network which will be based on 15 Gamma Olympic processors and a Digital Equipment PDP-11/70.

£350,000 of the order is made up by the Gamma Olympic hardware, which is based on the General Robotics Triton processor that uses a DEC LSI-11, and software prepared by Gamma Telecommunications Systems of Wokingham.

Allders will use the PoS network to handle all its in-store merchandising control and this includes such applications as in-store sales accounting, and unit stock control, while further developments planned are point-of-receipt and customer credit control.

Equipment will be installed at most Allders branches, including Arding and Hobbs of Clapham Junction, and Whiteleys of Bayswater.

There are two terminals in the new 9500 range, which was officially announced this week. They are based on the Intel 8080 microprocessor.

The ICL 9510 is interactive, and designed for online use with a system controller either in-store or via Post Office lines. It can also be used as a stand-alone device which uses a cartridge recorder for data storage.

The other terminal, the ICL 9512, has been designed primarily for cash collection, cash receipting, and data capture in stand-alone situations. It has all the facilities of the ICL 9510 but also incorporates 32 programmable accumulators for easy audit control, flash totals and sales analyses.

Volume production will take place at ICL's Utica, US, factory, although the 9550 controller range will be manufactured in the UK at Kidsgrove and Letchworth.

Inmos goes for multi-site, multi-product plans

By MARTIN BANKS

PRODUCTION plants and research centres in more than one location in the UK and the Far East are being considered by Inmos as part of its future plans in which a single chip micro and range of other products are likely to be more important than its much publicised interest in a 64K random access memory.

It is even possible that the National Enterprise Board microelectronics venture will buy the 64K RAM from another manufacturer.

Among the areas being considered are Warrington New Town Science Park, Tyneside and the Scottish Lowlands where there are already strong enclaves of semiconductor and electronics manufacturers.

Site selection has not yet officially started, but is expected to begin soon.

These facilities, part of the company's five-year plan will all be concerned with wafer, fabrication. The assembly of the chips is expected to be carried out in a low-cost labour area, probably in the Far East.

The emphasis has so far been on the 64K RAM that Inmos is scheduled to produce, but of far more long term importance is the company's plans in other areas. A whole product range is being developed, a key element of which will be a single chip microcomputer.

By committing itself to the NMOS process technology, Inmos has a large potential product range to choose from, extending from ROMs, RAMs and PROMs, through peripheral and control devices, to both large number crunching micros and single-chips with plenty of ROM, RAM and I/O interfacing on board.

What is not yet clear is whether a 64K RAM developed by Inmos will offer significant performance improvements over existing devices on the market, which would warrant an initially higher price and lower availability; or if it will be broadly similar in capability, which would require it to be available immediately in quantity and at low cost. Intel's 8021 8-bit microcomputer, for example, is now priced at $3 in volume in the US.

The key question in this is how fast the production lines can be established. Although a team of process people is being assembled by Inmos, it has not yet placed any orders for production equipment, even though its own estimates suggest that its first products will be available within two years.

Although the design cycle for a RAM is shorter than for a micro for such a small company — only 10 people at present — to do both at once seems a tall order. It is therefore possible that one product, probably the 64K RAM, will be bought in from an existing manufacturer.

This route may also be followed as a means of "tuning" the production plant, when it is established. This would mean taking a second source licence on an existing product, say a 16K RAM, and running it through the new plant.

Sicob 'snowstorm' over Burroughs' plant closure

A MINOR sensation brought business to a halt at the Sicob computer and office equipment exhibition in Paris last week, when a group of demonstrators staged a "manifestation" from the gallery overlooking the IBM stand.

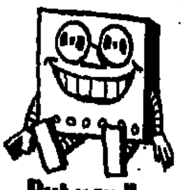
Their wrath, which took the form of a snowstorm of leaflets, fell rather unfairly upon IBM, since the cause of their discontent was Burroughs' decision to close its Pantin research centre.

The leaflet was an open letter to M. Simon Nora, co-author of a major report called The Informatisation of Society, and suggested that moves like the closure of the Burroughs centre by multinational computer companies threatened France's ability to survive as a major computer power.

It accused Burroughs of closing the centre without reference to the French government, and suggested that the real reason was not that it was uneconomic for the company to operate similar centres in the US and France, but that as the growth in its R&D expenditures was exceeding growth in turnover worldwide, the company wanted to move all its R&D back to the US.

A Burroughs spokesman in Paris told Computer Weekly that 70 people were affected by the closure of the R&D centre and that all would be offered other jobs within the company. "We have not replied to the letter because we believe the points it makes are nonsense," he added.

The CGT, French Trades Union federation, has also complained about computer companies reducing their R&D effort in France.



Honeywell to build 24 Sigmas for Comshare

FOLLOWING an urgent requirement for more hardware at the big Comshare timesharing bureau based in Ann Arbor, Michigan, Honeywell has agreed to build 24 new Sigma 9 mainframes for the company under a $14.2 million contract.

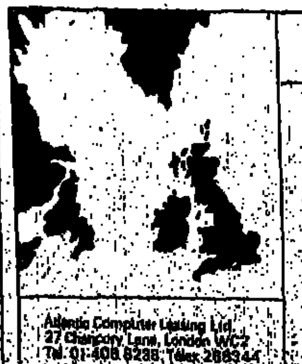
It is understood that the new processors, to be built at Honeywell's large systems plant at Phoenix, will be assembled substantially from existing parts inherited from Xerox when Honeywell acquired the installed base of Xerox data systems, but that some custom circuit chips which are no longer available will have to be redesigned.

Honeywell's solution for the mainstream Sigma users who run the Xerox CP-V operating system is an adaptation, CP-6, designed to run on Honeywell's Level 66 mainframes. However, since Comshare runs its own operating system and not CP-V, this solution was no help.

Comshare's Sigmas run under the bureau's own Commander II operating system. It is planned that the new Sigmas will be backed with up to 16 Megabytes of MOS memory to accommodate functions normally swapped in and out from 3 Megabyte-per-second rapid-access fixed-head disc.

Divis on stream

A FIRST dividend of five pence a share is to be paid by DataStream, the computerised financial information service.



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COMPUTER WEEKLY

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Briefing

System 3 replacements

A MAJOR announcement from IBM's General Systems Division is expected shortly, possibly before the end of the month. It will consist of replacements for the larger System 3 computers up to the System 3/15D, and US sources say that it will be much more than a simple extension of System 34.

At present code-named Project Pacific, the new line is expected to include two models and to offer tough competition for the bottom end of DP division's long-delayed E-series.

ICL in S Africa

AS part of its plans for an indigenous computer industry, the South African government is seeking licences from ICL to build unspecified computers, managing director Dr Chris Wilson confirmed to Computer Weekly. "I know of no African country threatening a boycott over our South African business," he added, noting that ICL was talking to the Nigerian government about local equity participation in ICL Nigeria.

● SA builds own computers, page 36

Prestel prices

PRESTEL prices have been agreed between the Post Office and the Association of Viewdata Information Providers and will be announced soon. To users the prices are expected to be 2p a minute for use of the service, plus a local phone call and the Information Provider's price per frame. IPs will pay a rate ranging from £4,000 a year plus £4 a frame to £1,000 a year plus £1 a frame depending on frequency of update and length of contract.

Fewer redundant

COMPULSORY redundancies at Plessey's Edge Lane plant have been reduced to 45 after a two week sit in. The number of men said to be surplus had been reduced by redeployment and voluntary redundancy from 600 in July (CW, July 6) to 100 on September 26 when the sit-in began. Last Thursday Plessey obtained a possession order on the System X development building which AUEW/Tass members had been occupying but the men left after Friday's negotiations.

Merger talk

MAJOR restructuring of the UK electronics industry seems imminent. It is likely that GEC will buy Plessey's semiconductor business, though neither company would comment. It was also suggested in the City that Racal will buy Plessey's 24.4% stake in ICL, and that Racal is interested in taking over EMI, or that EMI and Decca might merge.

Secrets arrests

TWO men have been arrested in Santa Clara, California, accused of attempting to sell $1 million's worth of Intel's trade secrets.

Orbit foreshadows new IBM marketing strategies

COPIOUS evidence for far-reaching new IBM marketing strategies has been discerned by US analysts and users in the company's announcement last week of the 8100 distributed processing system, previously known as Orbit.

Unbundled software, aggressive hardware pricing, the use of advanced technology, major advances towards improved programmer productivity and cheaper maintenance are seen as the most significant features. All the software, including the two operating systems and the new Cobol and Fortran compilers is charged, and available on rental only.

Major step forward — see page 5

"I'd guess that a user paying $2,000 a month for 8100 hardware could end up paying another $2,000 a month for software if he took both operating systems and the other program products," Gideon Gartner, computer industry analyst at Oppenheimer & Co, New York, told Computer Weekly.

Gartner's colleague, Aaron Orlansky, echoed this, adding that while software generated perhaps 7 to 9% of IBM's revenues today, in five years' time it could be 30 to 40%.

Bob Fertig, of Advanced Computer Techniques' Technology Analysis Group, was particularly interested in the software features in the 8100 such as an English-like terminal oriented language which translates programmer commands into Cobol source code, thus contributing to programmer efficiency.

"The 8100 is also designed to reduce if not eliminate the need for high cost systems and field engineering services, enabling IBM to price its hardware very aggressively while maintaining profit margins.

At a meeting in Italy last week of Seas, the European Association of IBM large system user groups, the users were given very little information about the 8100, but first reaction was that it would increase competition

● Turn to page 9

Consult unions —by law

—SAYS MINISTER


BOOTH. . . . "legislation has a role."

EMPLOYMENT Minister Albert Booth believes legislation should be introduced which acknowledges the right of unions to be consulted before the introduction to an organisation of important technological changes that have a major impact on employment.

In an exclusive interview with Computer Weekly shortly after last week's Labour Party Conference in which the effect of micros on employment was discussed, Booth admitted that the government has "no figures worth publishing yet" on whether micros and computers will lead to a significant overall increase in unemployment.

Although legislation guaranteeing the right of recognised unions to be consulted on the introduction of new technology is unlikely to be introduced in the next Parliament, Booth pointed out that it was in line with proposals made last year in a government White Paper on industrial democracy.

Booth's insistence that legislation has a role in this area is based on his view that one of the major reasons for the inability of parts of British industry to manage successfully technological innovation, has been the failure of some management to consult the workforce at an early enough stage in examining the employment implications of new technology.

Booth believes that the way of preventing a neo-Luddite response to the introduction of new technology is to involve the workforce at all stages of the planning and decision process.

"The major difference between the effect of technology now and when the Luddites smashed machines in the 19th Century is the possibilities workers now have of influencing the policies which can ensure that technology provides a general benefit to the country and is not necessarily seen from the workers' point of view merely as a means of throwing them out of work," he commented.

● Booth interview in full, page 14

'4m jobless' discounted

A FLAT contradiction of the estimates of increased unemployment caused by micros, made in a report to the Department of Industry, has come from two research workers involved in a $1.5 million study.

A report to the DoI from the Science Policy Research Unit at Sussex University suggested that the applications of micros could lead to unemployment of up to 4 million (CW, October 5).

But Malcolm Ross of Arthur D. Little, and Chris Crozier of Cambridge Consultants, who are working on a multi-client study for Arthur D. Little, say they believe there will be little likelihood of unemployment caused in the office and administration area by automation because a company's need to handle information expands at the same rate as a system's capability to produce information.

Barclays ops argue over weekend work

RELUCTANCE of operations staff to work at weekends is threatening the around-the-clock computer support needed by Barclays Bank to extend its automatic teller Barclay Bank Card operation and Barclaycard authorisation facilities.

The bank wants the operation staff to provide full weekend cover at its Wythenshawe site, which has three IBM 370/168s and the new Gloucester computer centre due to become operational with three IBM 370/168s next April (Op Spot, August 24).

At present, Barclays is offering operations staff a shift allowance of about 30% to provide the service, but a spokesman for the National Union of Bank Employees, which is negotiating on behalf of the operators, said: "The bank will have to offer a lot more than that because the operators are extremely reluctant to give up their weekend leisure time."

The union and the bank have reached an agreement concerning the shift patterns to be worked by the Greater London Computer Centre and Harlesden staff as they prepare to re-locate to Gloucester.

To accommodate the re-location, staff have been transferred from GLCC to Harlesden and following talks with the union, the bank has agreed to let them work their old shift patterns until next April.

Anglo-French peri link-up?

COLLABORATION between UK and French companies on the development of peripherals was discussed at a meeting at the Sicob exhibition in Paris last month (CWI, August 3). Officials of the UK and French Departments of Industry were present, with representatives of leading UK and French companies in the field.

Principal UK companies involved are Data Recording Equipment and Data Dynamics. Main French peripherals manufacturers are Logabax, CII-Honeywell Bull and companies like Transac and Sintra in the CGE group.

SRC £1.4m grants for research

FUNDING to a total of £1.4 million is being provided by the Science Research Council for its research programme in Distributed Computing Systems.

Details of grants have just been announced. Prominent among these is £205,000 for a project at University College London under Peter Kirstein on "Communication protocols in the context of X-25 computer networks."

There are a total of 23 projects in the programme at present, some of which have been running for up to a year. Current funding runs up to 1981 or 1982 in most cases.

Other major grants are: £220,500 for Brian Randell's team at Newcastle University working on reliability and integrity of distributed systems, and £123,000 for Colin Whitby-Strevens at Warwick University to design and construct a building-block system for distributed computing.

● Background — see page 9

COMPUTER WEEKLY'S INSIDE NEWS

IT'S LA BUREAUTIQUE

The French call it La Bureautique, which is a concise way of talking about the automated office and all that such a concept involves. Fred Lamond discusses some of the latest trends in this month's Marketview, one of the regular features in the International section. From Washington, Cameron Davis reports on some new views on the information industry, and on the wider US scene Hesh Wiener takes a detailed look at the IBM-Memorex decision. There is also the usual wide coverage of world news of developments and applications. Pages [illegible]

THERE'S A CLICHE FOR IT

No well-turned-out DPer would be without his ready patter of jargon or, according to Angus McGubble, his little well-worn cliches. His life long hobby has been to collect these gems of the computer scene and in a rare public confession he describes the delights of hearing old friends and recognising new ones. Page 4

ALSO

APPOINTMENTS / PAGES 21-28, 37-63


Midos as Mavis saw it after the Mega byte

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COMPUTERVIEW

Amateur way of trying to re-invent morality

CODES of conduct for computer people have figured considerably in the professionalism debate that has been going on for some time. On this page we report on the deliberations of the group summoned to the Stanford Research Institute under the auspices of the US National Science Foundation to analyse "Ethical Conflicts in Computer Technology," and come up with a draft code of conduct for debating by the industry at large.

The aim of the meeting was ostensibly to find answers to ethical problems that are unique to the computer field, to which precedents from other areas may not apply. Sadly, the meeting fell far short of achieving this.

Most of the conclusions which the group solemnly pronounces have in fact nothing to do with computers at all, but are general principles, even truisms, that have been around for thousands of years.

"Having the power to subvert a system . . . does not give one the right to do so."

"The end does not necessarily justify the means."

"Two wrongs do not make a right."

Some of the questions posed are even sillier. "Is it fair to use a computer to another's disadvantage?" Just rephrasing that to "Is it fair to use a screwdriver to another's disadvantage?" points up how fatuous it is. It does our profession no good at all in the eyes of the public to be seen trying to re-invent morality in a most amateur fashion and at the US taxpayer's expense.

There are some specific ethical and legal problems that computing presents, and it would have been useful if the Stanford meeting had come up with some answers to these. They include the ownership and patentability of software and firmware, and personal responsibility for bugs in programs that only the author knows how to fix. The meeting stated definitely that a programmer is ethically responsible for the correctness of his work, but what about several years later, when he has moved on to a different firm?

There are three classes of behaviour in the business involving ethical judgments:

First, that which is (or ought to be) illegal, or is actionable as breach of contract. Examples of this would be fraud, or failure to produce a product to specification.

Second, that which is not illegal but is liable to bring the profession or its organisations into disrepute. This could involve breaches of confidence, or unfulfillable promises.

Third, decisions involving purely personal values, such as whether a job one is working on will improve or harm the quality of life of the people affected.

Only the second of these categories is the proper concern of a code of conduct. For specific aspects of the business such as recruitment agencies, codes of conduct are well-established and necessary. For instance, they discourage the tempting but dubious practices that can arise in a hot market for staff.

Regarding the first, where laws do not exist and are seen to be needed, lobbying for them is praiseworthy, but codes of conduct are no substitute.

INTERRUPT

THE Orion Organisation and Monitor Program was a masterpiece of programming. There was hardly a loop which didn't modify itself during execution. Routines would be miraculously overlaid between, and in some cases during, execution. No advocate of structured programming could look at OMP and sleep peacefully in his or her bed again. Every line was a fiend, foreboding chaos for the unwary.

And yet OMP worked wonderfully well, and so the systems programmers, having writ, moved on, handing over to a maintenance programmer.

Despite its style, OMP was comprehensively annotated, but clearly it hadn't always been so, for one day, when the maintenance programmer was attempting to make an enhancement, he came across an exceptionally obscure piece of code for which the only annotation read: "When I wrote this routine, only God and I understood how it worked. Now God alone knows."

Moral: When confronted by the piece of code which passes all understanding, call in a consultant.

● This week's £5 prize goes to M. J. Pickett of Twyford, Berks.

FOCUS

Not DPM's main concern

THERE is no doubt that IBM dominates the computer world and is hoping to extend that domination with a rash of new announcements. Last week it went into electronic mail. Orbit and according to some well known reliable sources, a new range of E and H machines are waiting in the wings (CW, August 31).

However, for those of us still masterminding the techniques of 360s/30s, System 3 (Model 1) or even 1130s, such news will be of only passing interest. On the other hand, news that IBM was about to produce a workshop manual rack which permitted random access, or was issuing all service engineers with fast access Honda bikes, would be of considerably more interest.

Watching IBM, however, seems to have become an established industry in its own right. Articles are written, analyses made and seminars held with the objective of forecasting IBM's next move.

Just who benefits from all this attention — apart from the organisers of such sessions as "IBM — the next five years" — is difficult to define. Many DP teams for instance, are far more concerned with the next five days, let alone weeks.

In any case, given a spare five minutes or so, the average DPM could quickly quantify any new IBM range:

- It will be increasingly based on microelectronics;
- Probably incorporate floating bubble memories;
- Feature improved communication and storage facilities;
- Be designed for all levels of customer — from the first-time user to the advanced level specialist installation.

I wonder what thinking lurks behind the code names of IBM's new product. Does the E type mean faster access and will the H series bomb out even faster? And will Orbit (now called the 8108) keep going round in circles?

While various IBM-based service industries such as software and system houses and bureaux may well be keen to discover IBM's intentions, the average user has, for the time being, other matters of more immediate concern.

What can be guaranteed is that speculation does not assist the task of the DPM, especially those who may currently be evaluating a new or proposed system. Should the project be held back in anticipation of a new range announcement? Or rushed through in order to take advantage of possible price reductions before the range is finally withdrawn?

DP management could well be adverse to investing their — and their companies' — future in brand-new technology. Bubbles, particularly white-hot ones, have a habit of bursting.

Even allowing for the fact that existing machine level techniques have not been fully mastered, at least there is a considerable body of expertise available to put things right. This is not the case with new products. All parties are in the same boat together.

More significant perhaps to the DPM was the report (CW, August 31) that the IBM Users Association may be opening doors to plug compatible users. The opening of these doors could be a turning point for the whole industry.

There is little doubt that the presence of PCMs has been of considerable benefit to IBM. Their customers are presented with product options not available to other computer ranges. The IBM user, far from being limited to purchasing enhancements from the mainframe supplier, can shop around without invoking much in the way of manufacturer hostility.

As a result, all parties benefit: IBM, whose products are supported by powerful independent suppliers; the user who can often achieve considerable purchasing savings; and the PCM who has an ever expanding market place.

Code of conduct guidelines to be published in US

A SUGGESTED code of conduct for computer professionals, arising from a three-day conference on computers and ethics held in California last year, is about to be published by the American Federation of Information Processing Societies.

The code forms the last chapter of a report of conclusions reached at the conference, and is intended to stimulate discussion of the issues in the industry at large.

The meeting, funded by the National Science Foundation was held at Stanford Research Institute under the direction of Donn Parker. The 32 participants included lawyers and philosophers as well as computer people, and one Briton, Dick Waller of the BCS professional panel.

The aim of the meeting was to establish how general ethical principles apply to conduct in the computer field. According to Parker, codes of conduct that now exist are without substance and do not give specific guidance on what should be done in practical situations.

Because of the unique nature of computers, Parker says, precedents from other technical fields may not apply.

The meeting was given [illegible] descriptions of 47 imaginary situations of ethical conflict related to computers. They were asked to comment on the propriety of the behaviour of the characters in each case, and where a sizeable majority agreed, some general principles were extracted from their views.

The situations put forward for comment included such issues as: The use of computers for unauthorised purposes, taking advantage of loopholes in security systems, accepting responsibility for the quality of work in programming and design, conflicts over the ownership of software, and the disclosing of personal information.

Other issues were: Obligations towards customers regarding the quality of the work and the uncovering of fraud in accounting systems.

The general conclusions reached were largely along the lines of: Having the power to do something does not give one the right to do it; a consultant has an ethical obligation to offer services in the best interests of his clients; and, deception is unethical. The participants tended to be stringent in what they expected in the way of ethical behaviour from the people in the case studies, criticising actions or lack of action that many might consider unexceptionable. They also expected a high degree of loyalty to employers.

No attempt was made to get the participants to agree on a specific code of conduct for computer people, but an analysis of all the responses was made after the meeting by Paul Strassman, a senior executive with Xerox, who then drew up a tentative code which is appended to the report.

The full title on the report is Ethical Conflicts in Computer Science and Technology. Copies will shortly be available from SRI International in Menlo Park, California.

● See Computerview.

Ten years ago...

COMPUTER WEEKLY **OCTOBER 10, 1968**

TO meet expanding activities and responsibilities, the British Computer Society was to appoint a full-time secretary general, and to take over additional premises for headquarters staff . . . . Nottingham Co-operative Society ordered an NCR Century 100 computer to be delivered in October, 1969 . . . . Criticism of State organisations that ventured into the commercial service bureau business in competition with independent operators was voiced at an open discussion meeting of the BCS's London branch . . . . First delivery of IBM 3980 bank terminals was made to the Bank of Scotland in Edinburgh. . . . A mass memory computer store costing less than 2d a bit, and known as the G memory, had an access time of 1.2 microseconds and units could be connected either in series or in parallel.

CAFS to go on trial with directory inquiries

THE still unannounced ICL Content Addressable File Store, Cafs, is to go into trial service with the Post Office for directory inquiries at two exchanges at the end of next month.

First details of Cafs were revealed in Computer Weekly last year (October 27, 1977). It consists of an array of parallel processors linked to a disc subsystem and runs as a back-end to a mainframe. The Post Office will be using an ICL 1903A in the trial.

The hope is that the trial will lead to a national computerised system for directory inquiries, which could be in service by the mid-1980s. For this the Post Office will need some 3,000 video terminals, and is sounding out industry for a low-cost terminal. GEC is one company which has been approached for this.

Half of the 15 million UK directory entries are stored on the Cafs discs, and for the trial operators in Leatherhead, Surrey and Leeds, Yorkshire, will answer directory inquiries via a VDU attached to the Cafs system for all the directories stored on the system.

The 30 or so UK directories not yet stored on Cafs will still have to be used manually at the two exchanges, but these are expected to account for only about 15% of all enquiries.

Cafs enables the operator simply to key in salient features of the name and address of the subscriber whose number is wanted. The full details will give a single number, but incomplete information will cause several numbers to be displayed: for example Hospital and Bedford would cause all the hospitals in the Bedford directory to be displayed.

With over 60 directories currently in use and the number growing every year, the Post Office is planning to reduce the volume of the stored information by using microfiche, each fiche storing 64 pages, as a stop-gap measure.

Shepherded across the threshold of the new BCS headquarters by the retiring BCS president, Professor Paul Samet (background), the Patron of the BCS, the Duke of Kent, is greeted by the new president of the society, Professor Frank Sumner. On the left is next year's BCS deputy president, Julian Bogod and on Professor Sumner's left is Mrs Joan Samet. At the headquarters opening, the Duke was presented with a pair of BCS cufflinks and a tie.

BCS sets up task force on membership 'impediments'

SHORTLY after the Duke of Kent had officially opened the new headquarters of the British Computer Society in London, the society announced the establishment of a task force to formulate proposals to help overcome "impediments to increasing membership of the BCS."

The task force is to be led by Frank Hooper, assistant to the general manager at Barclays Bank.

It is expected to provide a report in time for the BCS council meeting next March. The report will establish present and potential advantages of BCS membership, and identify impediments to gaining more members.

Defections delay Mostek launch date

"ONLY a marginal delay" was how Paul Mayes, managing director of Mostek UK, described the effect on its 64K RAM development of the defection by a group of Mostek employees in America to the NEB fledgling, Inmos.

Speaking at the Press conference to introduce its latest additions to the add-in memory range (see Micro News Page 17) he said the defections had put the launch date of the part back to March or April next year, from a target date of December this year.

At the same meeting, Barney Carrell, managing director of Real Time Controls, one of the two distributors appointed by Mostek for its add-in memories, condemned minicomputer manufacturers for what he called "ripping off the customer".

He was referring to the practice of manufacturers of trying to "lock-in" customers to their own hardware, especially where system expansion products, such as add-in memory, was required.

Union calls for freeze on word processors in the Post Office

A FREEZE on the introduction of word processors into the Post Office is being insisted on by the white-collar union, the Civil and Public Servants Association, until a study on staffing implications has been carried out. But the union has agreed to a set of trials of word processing under specific conditions, lasting about a year, and involving several different machines.

Even the replacement of existing automatic typewriters has been banned by CPSA. This presents the Post Office with an immediate problem as it wants to replace some old Flexidata paper tape typewriters with Kalle Infotec 7000 magnetic tape machines, and the union will not agree to this yet.

The CPSA is annoyed because, it says, the Post Office, and the Civil Service, have been introducing stand-alone word processors without consultation with unions and without proper trials. Jeanne Drake of CPSA said, "Our people are getting edgy because of fast technological change."

Another concern is the effect of automation on bonuses and special allowances. Typists put on word processors can get extra money for "specialist typing" but at the same time lose proficiency allowances for audio, shorthand, and the like, even though these skills are still needed with the WP equipment. The union wants these problems sorted out before new machines are brought in.

The agreed trials will take place in Post Office typing pools only, in about seven different locations. A trial of a Wordplex 7 shared-logic system at the Department of Education and Science at Darlington is now complete, with the evaluation yet to be made public.

Reports on the reaction of staff at Darlington are conflicting.

IBM cuts prices on processors

PURCHASE and rental price cuts on top end IBM 370, 3030 and 3700 processors were announced at the Share European Association, SEAS meeting last week. Biggest cut is on the 3790, which falls 35% on both purchase and rental following announcement of its 8100 successor. All models of the 3030 series are also affected, with purchase prices of the 3031 falling 5 to 15% and rentals to 5 to 9%, while prices for the 3032 fall by 5 to 11% and 5 to 7½%, and for the 3033 by 5 to 8½% and 7 to 8½% respectively.

Cuts of up to 5½% have been made on purchase prices and 2½% on rental prices of large models of the 148 and 138; 3350 and 3344 disc drives are both cut 15% on purchase and 10% on rental prices, and wide-ranging cuts of up to 25% have been made on the purchase prices of obsolete GSD computers including the 1130, 1800, System 7 and 360/20.

Service links six countries

THE very high level VSPC data and file manipulation language has been introduced by IBM as the basis of a new time-sharing service in six European countries.

Called the European Personal Computing Service, it is based on a 370/158 in Zoetermeer, Holland, and will also be available in the UK, France, Germany, Italy and Belgium via an international SNA network.

VSPC, Virtual Storage Personal Computing, provides a near-English user interface to files and systems written in VS APL, VS Basic, PL/1 and a Fortran subset. It runs under any VS operating system, (CW, December 18, 1975).

Scicon pack for TSB cheques

A NEW hardware-software package from Scicon which enables a batch mode IBM 370 to support data transmission has been adopted by the Central Trustee Savings Bank to handle cheque clearing from the Altrincham Group of TSBs.

Called XT 11, the Scicon package runs on a Digital Equipment PDP-11 mini and makes the communications system look to the IBM mainframe like a 3411 tape drive.

The CTSB system includes a PDP-11/34 linked to a 370/135 at its London computer centre via a DX-11 channel interface. The mini is backed by two disc units and three tape drives and supports binary synchronous communication over 9,600 baud lines to each of the four Altrincham Group computer centres in the north of England.

The computer centres are all equipped with ICL System 4 mainframes and the Olivetti SP600, which is a packaged version of the PDP-11.

Good Lord...

EVERYBODY, but everybody, as I have said before, is getting into the act of pronouncing on the Social Impact of Computers. Even walking in Leicester Square, when you get a religious tract pressed into your hand, you will probably find that it explains all about computers to you.

A recent issue of Awake! published by the Watchtower Society has a lead story entitled "Computer — Tool or Tyrant?" which sets out to reassure us that computers "remain an extension of God's handiwork, not an improvement to it."

It continues, "The computer is a machine, not to be feared or revered by man, but to be used to relieve certain burdens and provide him the freedom to experience more fully the joy of living."

Does your computer help you experience more fully the joy of living? I certainly hope so.

Another passage says, "To some, the computer is the mechanical genius that can instantly notify a person that reservations are confirmed for a 10,000 mile (16,090 kilometre) trip."

A reader's reaction to this was, "To some, a human being is an organism that can go through an article, mechanically converting every reference to miles into its exact equivalent in kilometres."

Still, remember: except the Lord build the computer system, they that build it labour in vain.

No answer to that

WE all have experience of shop assistants who know nothing about their wares, but in the computer business we usually expect salespeople to have a clue or two. However, with the mushrooming of hobby shops in the States, it is only to be expected that there should be problems with staff. . . .

An Englishman of my acquaintance, doing his bit for the old country at Wescon in Los Angeles, went into a computer shop where a personable young lady gave him the usual slick sales pitch along the lines of "Here is our latest personal computer that will do your income tax, the washing up, your child's homework, and hum the Star-Spangled Banner, all for only two dollars fifty. . . ."

"Fine," said he. "What languages does it have?"

"Sorry," was the reply, "we're fresh out of languages."

After some bewilderment, my friend established that in fact the shop had sold out of cassettes.

I'm sure that normally the shop is a veritable Tower of Babel.

● What do you suppose the blue-rinsed Times readers in Godalming and Chalfont St Giles made of this advertisement in their paper's Personal column the other day? "Pet computer for sale."

Well, people keep pet Borzois and pet cockroaches, why shouldn't they have pet computers?

A sick system?

THERE have been plenty of reports of computerised medical diagnostic systems, and I expect we are all steeling ourselves for the inevitable day when we have to get our sick notes from a mechanical doctor. But a mechanical patient is a new one on me.

At Southern General Hospital, Glasgow, they have a computerised patient for the medical students to practise on.

I expect it works like an Apollo Moon Landing game: Too many drugs prescribed and you get a message, "Sorry, your patient has just hit the surface of the Moon at 20,000 mph."

What would be really interesting is if the computer doctor and the computer patient were connected together. Think of the endless fun they could have! There is no reason why they shouldn't be the same computer, time-shared. Then the doctor part could be a psychiatrist, busily psychoanalysing itself.

If this became widespread, it would delight the Health Service administrators. How much easier it would be to run the NHS if they could get rid of all the people!

● There's hope for us all: Professor Paul Samet, Director of University College London Computer Centre and President of the BCS, when he was at school applied for admission to UC as an undergraduate and was turned down.

In the fast-changing world of technology everyone needs something to hold on to; some symbol of continuity. Lawyers have Latin, doctors have receptionists, vicars have cassocks and DP people have . . . clichés. So argues ANGUS McQUIBBLE, a leading expert in end user interface situations with price/performance throughput considerations.

Or, as we say in the trade, cliché consultant. In this exclusive article, McQuibble discourses upon his favourite hobby. . . .

Some hints on collecting DP clichés

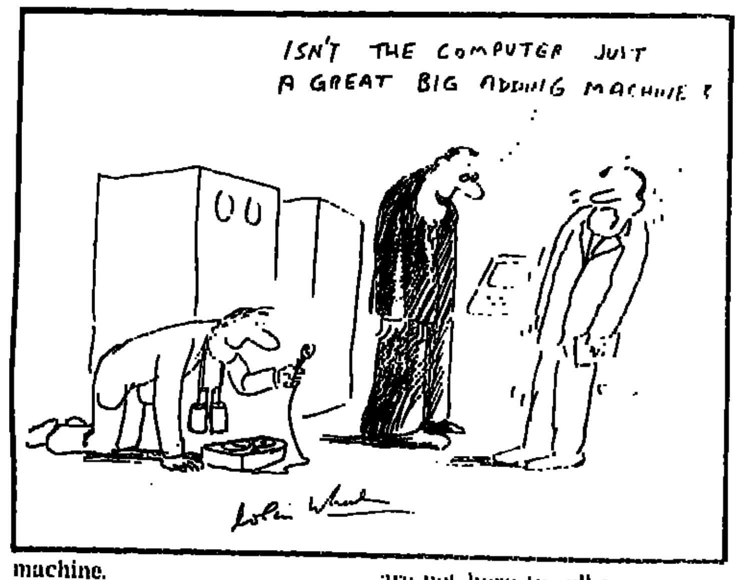
PEOPLE often ask me why, out of all the hobbies, sports and vices available to someone of my indifferent-to-middling income and physique, I have chosen to devote my leisure to the collection of the DP cliché.

It is difficult to give a simple explanation. For instance, it is hard to say whether I get more satisfaction from hearing a familiar cliché said again, or from hearing a phrase which the trained ear recognises as an emerging cliché. All I can say is that my collection brings me enormous pleasure, and I am grateful for this opportunity to invite readers to share in my enthusiasm.

If a beginner asks me for advice on how to start a collection, I usually tell him to begin in a small way, collecting the clichés that can be easily found around his work-place. Many of the finest collections have started with the reasons why a project will cost so much, why it is overrunning, why it does not work. That is how I began.

I branched into my own speciality accidentally, on the day when I entered the executive washroom off the main foyer and surprised a smart young stranger talking with keen sincerity into the mirror above the washbasin. It was then that I discovered the DP selling cliché. Other members of the Cliché Collectors Club urged me to move into the High Technical cliché such as "DL/1 is the natural successor to DBOMP" or into the Simplefolk Cliché, such as "I really know nothing about computers, but isn't there the saying garbage-in-garbage-out" or "Forgive my ignorance, but isn't the computer just a great big, sophisticated adding machine." My friends assure me that there are interesting variations to be found in both these fields, but I have always found them a very limited area of study, not to be compared with the fascination of the selling cliché.

Beginners who are starting a Selling Cliché collection ought to look first for the Single Cliché. There are two common examples: on cost, the single cliché runs, "You will probably find that we aren't the cheapest, but . . ." and on performance, "30% better." The Performance cliché is used when making a comparison against the present machine, against any bigger machine and against any smaller machine.



Then the beginner can start to build up his collection of Multiple Clichés. For instance, the availability of promised software produces, "Imminent/any day now/a matter of weeks/long before you are likely to need it/just waiting for the legal people to clear the small print." Machine Size has, "Ample /Bags of K/ All you are likely to need for years and years." Database produces, "Partial/Modified/ Doesn't go all the way/a long way short of Total." (I was always puzzled by the Database cliché, but DP people tell me that most influential lay-folk reach for their revolvers when they hear the word "database." Experienced DP salesmen know that they are expected to stand by database as a concept but to deny that they would ever dream of letting the lay-folk into its full application. Thus, they would use the phrase "partial database" even though their proposal links the daily postage stamp denomination analysis to the 1990 strategic plan). . . .

Maintenance produces, "Not a problem, in fact a strength/ Highly trained staff/ Advanced diagnostic skills/ Country-wide coverage/In a matter of hours — though maybe not on Christmas Day, ho ho ho." Conversion has "A dawdle/so easy you won't notice it/transparent to the user/a piece of cake". This is sometimes accompanied by a sideways flicking of the hand, which symbolises brushing away an inconsequential piece of cake with the help of powerful new conversion aids.

Manufacturing systems software is always "Comprehensive/designed to fit user requirements/needs the minimum of adaptation/proven in use." (I have never found any need to test the truth of clichés, no more than would a stamp collector feel the need to verify at first hand the accuracy of the royal profiles depicted, but friends in the DP business assure me that such a manufacturing system does exist in a factory in Tierra del Fuego.

Having mastered the Multiple Cliché, the collector can move to the Chained Cliché. The best example is the cliché used at the initial meeting. This begins, "We are not here to sell you a computer," and then follows — after a wry smile — "but we'll be disappointed if don't." This is then linked to "The reason why we are here is to help you face the challenge of change to cope with the ever increasing complexity of modern business/to support your plans for future growth/to help hard pressed management." An optional cliché at the end of this chain — but only attempted by those who can say it with a straight face and without giggling is, "You see, we too believe in the future of British manufacturing industry."

I hope I have managed to convey the fun of recording a cliché for the first time and the excitement of hearing it again, and again. But one of the m fascinating areas for the e perienced collector has be opened up by semantic differ tiation analysis. With suita training in this technique, the collector can identify the Phased Cliché. Here the cliché takes on different form according to the preconceived prospects of suc cess at each stage in the sale contact.

For instance, the initial phase might produce, "Well that ought to provide a useful benchmark" and would escalate through successive phases from, "Good in its day, but . . ." and "I don't want to knock a competitor, but . . ." until, "Well, they would say that wouldn't they?"

Another example in my collection deals with the abilities of the DP manager. The initial phase produces, "An experienced DP man like yourself" ascends through, "Forgive me for saying that I am surprised that an experienced DP man like yourself" and, "Of course, if you had actually . . . you would know," through to the chairman-to-chairman letter which runs, "While I have no wish to interfere in the decision which I understand has already been taken, I feel in fairness to your company that I must express our own doubts over whether the knowledge and experience of your DP management is strong enough to allow them to reach a sound decision on this matter."

People sometimes ask me whether, if DP salespersons know that enthusiasts like myself are collecting their clichés, they will be willing to provide them in the future. I believe they will. In a fast-changing world, everyone needs something to hold on to. Some symbol of continuity. Lawyers have Latin, doctors have receptionists, vicars have cassocks. For the DP man, the cliché fills that role.

Labour split on Freedom of Information Act

THERE is now a clear split between the Labour Party and the government on a Freedom of Information Act.

At last week's Labour Party conference in Blackpool, a proposal was passed calling on the government to introduce legislation in the next Parliament, and a draft Information Bill was agreed.

In a White Paper on the Official Secrets Act, however, the government made it clear that it would not introduce a Bill at this stage as it believed further study was needed and it feared the costs of implementation might be too great.

The Labour Party's draft Bill fails to provide in-depth guidelines on the question of the access to personal files, although it has a whole section aimed at preventing the release of personal files.

It recommends that a national register be compiled so that citizens know where to go to find information.

Racal datacoms group acquires another firm

THE fast-growing new Racal Data Communications Group, which takes in Racal-Milgo and other companies in the data field, has acquired a new member, Enquiry Systems Ltd. Racal already had 20% of the company and is paying £378,000 for a further 69%.

The company will be renamed Racal-ESL Ltd.

The most significant product offered by Racal-ESL is a new small, low-cost store and forward message switching system controlled by a specially developed processor with a communications-oriented instruction set built around two four-bit AMD 2901 bit-slice micros.

The systems, which can be used as stand-alone message switching systems or as satellites to a larger switch such as the Case MSX or ITT 6400ADX, is in the £5,000 to £10,000 price range. Both Telex and Ascii coded messages are supported.

ESL had a turnover of £800,000 in the year to July 1978, and plans to double this within two years.

ICL's next PoS terminal

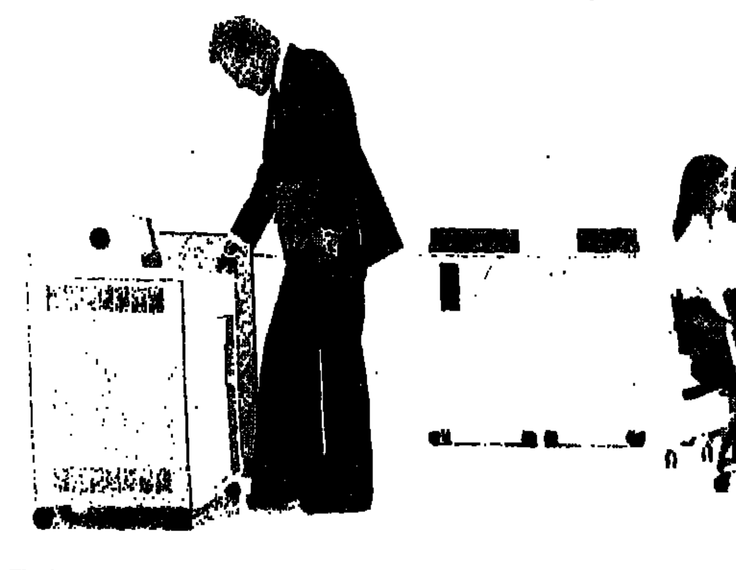
A FURTHER point-of-sale terminal, the ICL 9515, will be available early next year as part of the company's new 9500 series of PoS equipment which was launched in The Hague last week (CW, October 5).

Described as a master terminal to which ICL 9510 and 9512 terminals can be slaved, the ICL 9515 will, like them, be based on the Intel 8080 micro.

Highlighting the fact that ICL intends to attract not only its own existing customers, the 9515 will be able to communicate via most protocols, including those supported by IBM's SNA.

Orders for ICL 9500 equipment are already put at over £3 million by the company.

COMPUTER WEEKLY ANALYSES THE LATEST ANNOUNCEMENTS FROM IBM


The IBM 8100 Information System.

8100 Information System a major step forward within SNA

IF, as IBM said at the time, Systems Network Architecture was the most significant announcement since System 360, the 8100 Information System is the most significant announcement yet made within SNA.

The new DPPX operating system has been built up using the basic SNA structure, and the various levels within the SNA hierarchy are reflected in the layers within DPPX. The functions of the Network Control Program which runs on the 370X communications front-end processors, are contained within the operating system, which means that an SNA network of 8100s can be established with no 370 or 3030 series host.

Physically, the two 8100 processors, the 8130 and 8140, are 16-bit minicomputers with the ability to address 32-bit words, a feature increasingly being introduced on new minis, examples being the Modcomp Classic and the CTL 8040.

The instruction set is a superset of that on the 3790, and terminals are attached to the 8130 or 8140 on an SDLC loop, and polled from the processor. This method of attachment is already used for the 36XX series of banking, factory and retail terminals. Although 512K bytes is the maximum memory offered at present, direct addressing up to two Megabytes is possible.

The two most obvious drawbacks from the user's point of view, neither of which is likely to prove decisive, are that a processor change is necessary to upgrade from the 8130 to the 8140, and that he has to offload the DPPX operating system and load DPCX if he wants to alternate between running in native mode and running 3790 programs.

The Cobol compiler is a new one and some translation will be necessary to transfer programs from other IBM machines to the 8100.

The DPPX operating system is the system for the future, and the base system includes a full screen Source Program Editor and a test-debug program for interactive program development. For an additional fee, users can also rent Distributed Presentation Services, for screen layout definition, and Development Management System, for definition of application logic, both of which generate Cobol source code, but offer the user a near-English interface. This was one of the major aims of the System Q operating system which was scrapped with the IBM FS project to replace System 370 with a completely new line of mainframes.

The DPCX operating system offers several enhancements over the 3790. Remote job entry from the 8100 into the 370 host is offered, and displays attached to the 8100 can communicate with existing 370 applications with no additional programming.

'Making shared logic respectable'

THE principal extension of the IBM 3791 processor required to enable it to run the new 3730 text processing software, announced last week, was the addition of further memory; and existing 3790s installed with customers can be field-upgraded to add the software to their existing applications.

The 3732 word processing terminal, which is based on the 3270 display, and the 3736 daisy-wheel printer can be added alongside existing 3790 terminals, enabling people with a network of 3790s already in place to add word processing and electronic mail to their existing systems.

The entry by IBM into the shared-logic word processor market has pleased rather than dismayed other UK suppliers. "It makes shared logic respectable," said Logica's Pat Coen, referring to the fact that hitherto the giants of office equipment, IBM and Xerox, have only offered stand-alone word processors.

The UK is much more advanced in shared-logic WP than the US, he said.

There has been much debate about the effectiveness of multi-station word processors compared to stand-alone units, and IBM's prestige will lend much weight to the shared-logic argument.

Communications conference

A TWO-DAY conference, Communicating with IBM, will examine the communications options open to IBM users. Speakers will evaluate the IBM choice between SNA and Series 1 based networks along with third party solutions such as EMI Technology offers. They will include Ken Olisa of IBM and Eric Miller of Philips.

The conference, to be held at the Regent Centre Hotel, London, on November 7 and 8, will be followed by a two-day workshop on SNA by Saroj Kar, one of its leading technical evaluators.

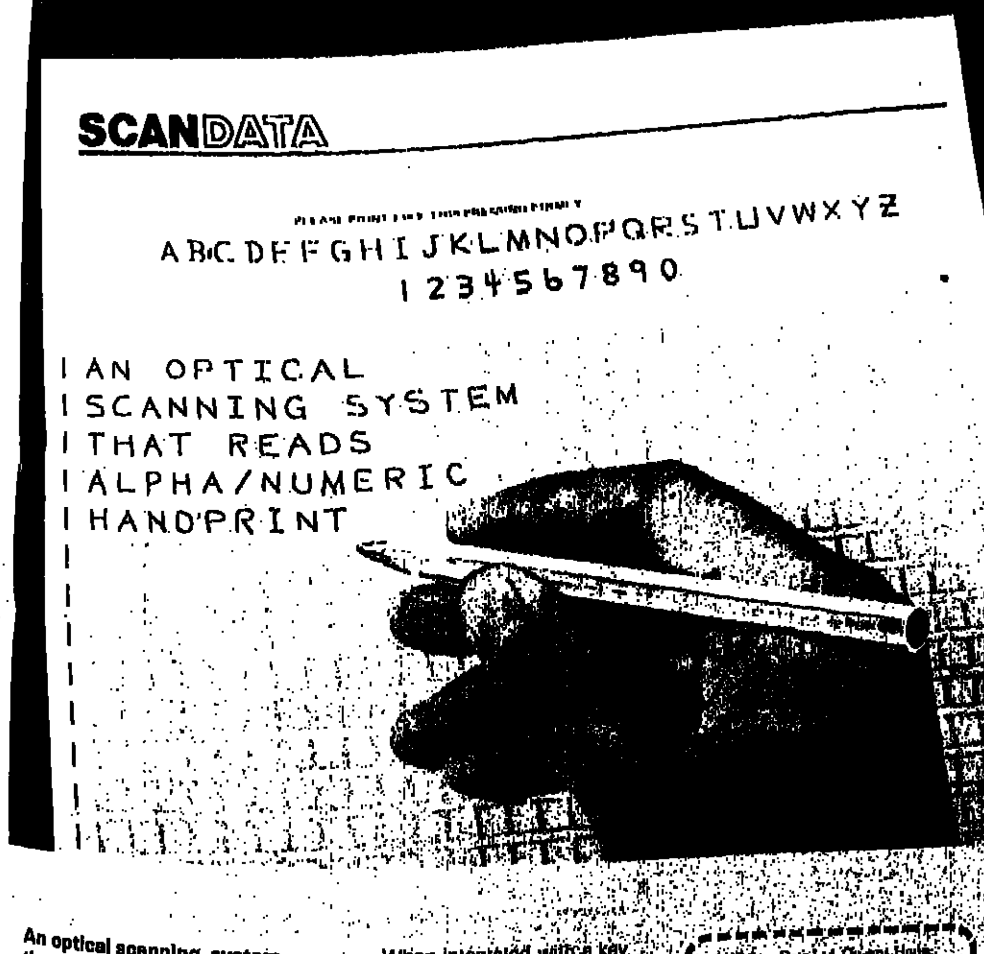
Back to the top with a 64K RAM

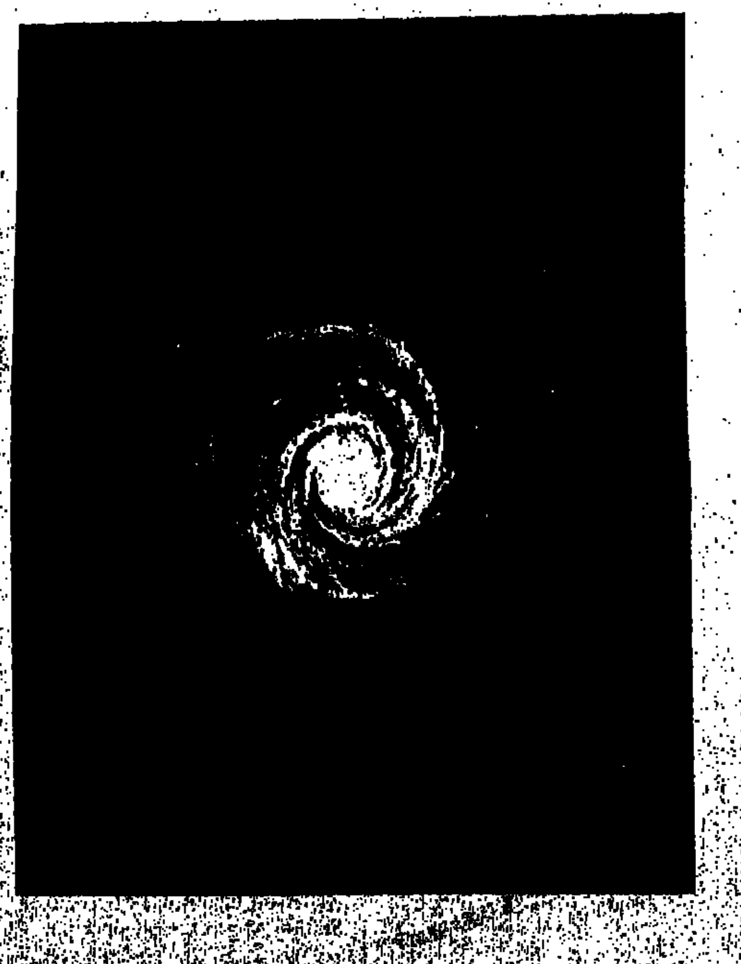
THOUGH it seemed to be losing its grip on memory technology with the purchase of both 4K and 16K devices from outside suppliers (CW, July 13), IBM has come straight back to the top of the pile with the announcement of a 64K RAM as part of the 8100 package.

There is, however, little information available about the chip, with the General Technology Division Laboratory in Burlington, Vermont, being coy about the part until the first 8100 shipments next year.

All that is known is that it uses a silicon and aluminium MOS technology that uses silicon nitride to enhance gate reliability, and a conductive field shield to control surface leakage.

Speculations within the semiconductor industry tend towards indicating that the chip will be a big one, and therefore hard to manufacture in quantity, especially if the shield is used to reduce parasitic leakage from the storage nodes, and if the aluminium is used as a gate electrode in thin oxide to form the storage nodes. One way round these problems would be to use a VMOS approach, as pioneered by American Microsystems Inc (CW, July 21, 1977). IBM has recently awarded a development contract to this company.





MICHIE'S PRIVATEVIEW

Competing with costs of human skills

IT has been a trade cliché of Artificial Intelligence for as long as I can remember that "our time will come". The world will surely need smart robots and machine translation and intelligent databases and the rest. It is characteristic, however, of even the truest prophecy that its fulfilment can take a form subtly different from that envisaged by the prophets.

Of course the world will need those things, and needs them now. But for the marketplace to exert a significant tug one of two things must happen: *either* (1) it must be possible to make the product for a good deal less than the going cost of human performance of the same function; or (2) abnormal circumstances must arise which push the going cost of conventional solutions through the roof.

The second eventuality is with us in one or two very special cases. The cost of underwater inspection, cleaning, and repair of North Sea oil rigs by human divers is so great that the prospects of meeting by these means alone the standards demanded by legislation are nil. It is not surprising, therefore, that commercial concerns of high technological competence are developing unmanned submersibles with powered manipulators and TV "eyes". Sophisticated computer control systems mediate between the sensori-motor devices of these vehicles and the remote commands of human operators in surface vessels. There is no absolute need to incorporate AI; but consider the inevitable next stage.

Once special need has forced the use of such costly systems, the economic promise of dispensing with the umbilical cable will act as a continual lure. The cable transmits power in one direction and signals in two. Without it, a free-swimming submersible must carry its own powerpack.

What about the signals? The situation is strictly analogous to that of NASA's Mars Rover vehicle for the 1980s. Cut off from human data interpretation and decision-taking, the vehicle must have artificial intelligence or be lost.

Abnormal costs of human skills are now arising in the Arab world. Strenuous attempts to develop modern health services are hampered by severe lack of trained medical personnel. Cash is not the problem. Indeed British medical visitors to Saudi Arabia and neighbouring territories report widespread purchase of the latest and shiniest American equipment, which the local level of medical and technical education is not adequate to put to use. Openings exist here for easy-to-use "expert systems" of the kind originated in the UK by de Dombal for the diagnosis of acute abdominal pain. In two year's experience of such a system at Bangour Hospital, near Edinburgh, a substantial rise has been reported not only in the frequency of correct diagnosis (the machine system pegs level in this regard with a good consultant) but also in the diagnosis capacity of the house surgeons whose skill it challenges. So there is a two-fold benefit, of which the machine-aided training aspect is probably of even greater Third World relevance than the device's primary function.

Cases like this are no more than local stirrings of a fresh breeze here and there. Gusts in a different area however are perceptible which could conceivably become a mighty wind. I am thinking of the trend towards automating the craft of programming. In a sense this has been going on since Brooker's Code and the compilers of the 1950s. But a qualitatively new fact of economics is raising its head which lifts program automation from the category of "very valuable to have," which it shares with smart submersibles and intelligent diagnostics, into the realm of a generalised emergency, liable to spread across the whole computer industry in the 1980s.

This emergency is the predictable effect of the miraculous success of hardware manufacture, of LSI technology and imminent VLSI technology. The ever-growing flood of newer and faster computery is already pressing against the limits of what the programming industry, at the highest imaginable rate of recruitment, can cope with. Part of the story is told in the accompanying table.

DATA PROCESSING INDUSTRY TRENDS

Indicator	1955	1965	1975	1985
Industry Growth	1	20	80	320
Hardware Performance Cost	1	10^2	10^4	10^6
Programmer Productivity	1	2.0	2.7	3.6

(from Dolotta, T A "Data Processing in 1980-85" ISBN 0-471-21786-7).

If the markets of the booming microelectronics industries are not to collapse from program starvation, radical innovation, not just improvements here and there, is needed in automatic programming.

Various schools and branches of computer science claim special relevance to this problem. Conspicuous among these is Artificial Intelligence.

There is a phrase about separating the men from the boys. The intensified need for program automation will assuredly do this.

PROGRAMMER NOTES

Are programmers a selfish breed?

PROGRAMMERS and analysts (in the US at least) don't give a damn for assuming responsibility for their work or for the organisation that employs them.

But what does motivate them is the work itself, technical achievement, feedback from technical supervisors — and their own personal interests.

Those are the startling conclusions of a survey of the motivation of DP personnel conducted by Dr Jac Fitz-enz, director of industrial relations for Four Phase Systems. The survey results are published in the September issue of the US monthly Datamation.

Programmers and analysts made "personal life" one of their top five motivators, while managers and project leaders placed this aspect low down on their list, as do most people in other similar surveys (see figure 1). Working conditions and salaries were low priorities for DP people but growth potential was a far higher priority for DP staff than for the general population.

Confirming a theory that DP people are individualists rather than company men, the survey found that of five motivational factors defined by a pioneer in the analysis of staff motivation, Fred Hertzberg, DP people placed the four ego-centred factors high, whereas responsibility, which is the only one which implies an obligation to an organisation, comes far below the norm for the population as a whole.

The ego-motivators are achievement, recognition, advancement and the work itself.

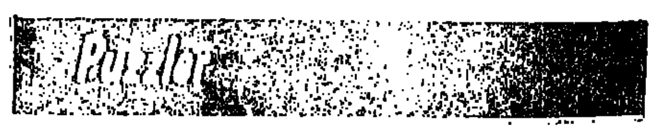
While managers placed responsibility as their main motivational priority out of a list of 16 factors and project leaders placed responsibility fourth, programmers and analysts placed this factor ninth.

The survey, which was based on interviews with about 1,500 staff in the US, showed that men from the total survey placed work itself as the highest priority and responsibility seventh place, whereas wo put responsibility much hig up, as their third priority, work in fifth place.

In trying to draw conclus based on the results, Dr Fitz admits that, despite follow interviews with some progr mers, the reason for their rating for responsibility has him perplexed and he call further studies.

Motivation factor	Priority ratings General	DP
Achievement	1	1
Recognition	2	4
Work itself	3	3
Responsibility	4	7
Advancement	5	5
Salary	6	10
Growth potential	7	2
Relations (with subordinates)	8	9
Status	9	14
Relations (with superiors)	10	12
Relations (with peers)	11	8
Technical supervision	12	6
Co. policy and admin.	13	15
Working conditions	14	16
Personal life	15	11
Job security	16	13

Figure 1. Comparison of priority of motivational studies; the general priorities come from a study of all occupations in 1960 by Fred Hertzberg and the DP results from the Dr Fitz-enz study.



STEWART Metchette, a US mathematician, has worked out all possible forms of the Digital Fraction 1/n = *ABCDE/FGHIJ. There are 94 solutions, ranging from 10836/97,524 (n=9) to 13,485/26,970* (n = 2).

There is no solution for n = 6, and only *one for n=7. Can you find it* before turning to page 61?

LETTER TO MICHIE'S PRIVATEVIEW

Epistemic illusions

I WAS most interested in Professor Michie's Privateview suggesting that "epistemic illusions" occur whenever we falsify in order to understand.

I should like to suggest that we go further. All sensory input is garbage until filtered by a hypothesis. We have to learn to see if we are to see more than meaningless patches of light, dark and colour, and all of the visual illusions depend upon learning to apply the filters of hypothesis.

Hearing follows the same pattern; hence the cocktail party problem. The same principle applies to conceptual meanings, which affect both conceptual judgments and sense data; if I dislike this man, I may hear him saying things I disapprove of.

In other words, there can be no sense data input to the central processor, nor any evaluation, immediate or high-level, except by a constant process of comparison with a hypothesis or preconception. The hypothesis is reinforced by apparent conformity with the processed input, but the processed input is itself partly prejudiced by the hypothesis, so that "apparent conformity" is not an unbiased standard of comparison.

Any gross difference is recognised — "the hypothesis is a lie" — but this only conceals the fact that, in the end, all hypotheses are different from the reality they attempt to match. All therefore are lies. We have only a choice between lies.

Now a computer can in some contexts measure "sufficient similarity"; I would accept your judgment as a specialist that the structures governing the comparison and the sufficiency could be, in time, made flexible enough and subtle enough to measure similarity of conceptual structure at several levels of abstraction.

Developments in fuzzy logic may become relevant here, though no matter how subtle or fuzzy the process might become, the explicit or implicit assumptions of the programmers must affect the inputs and outputs. The subtler, the more difficult to trace such assumptions.

However, I see two main problems arising from this. One is the communicability of the program's insights. Between ourselves, meaning is always conveyed by sufficiently similar analogy. In plain words, you need to know the language and you need the same cultural background.

Having the same cultural background is definable as having sufficient analogies in common (all words are analogies, of course). So the machine must have a pool of analogical structures to draw on large enough for us to understand its outputs. If it produces outputs too different from what we have got used to, we won't understand it. It may be necessary for it to be programmed to print out whole sets of analogies, "hoping" that the penny will drop. It will also be necessary for it to print intermediate stages of its hypotheses. We can't have decisions taken by man or machine unless the process is fully understood by which the data output is reached.

Second is that the "level" of hypotheses will depend more than we might expect on primary sensing processes. Men who by various means manage to shed some of the preprocessing, see and interpret the world in a very different way from the rest of us, though they commonly are said to conceal the fact for most purposes lest they be thought insane. The same effect can be seen in the case of insufficiently common cultural background: A difference of 30 points in IQ is said to result in mutual assessments of stupidity. Therefore, taking these two problems together, we have the case of a computerised program which cannot afford to be too close to reality, and yet for acceptability be close to our own perception of reality.

R.A. [illegible]

Maidenhead

SOFTWARE FILE

EDITED BY PETER HEWITT

Cobol is the bread and butter of the data processing world. It is despised by many academics and purists but can be ignored by nobody.

Being such an intrinsic part of day-to-day DP life, Cobol is often taken for granted as an unchanging part of programming work. But major changes are planned for Cobol in the 1980s, much of it signalled by the Codasyl Cobol 1978 Journal of Development which was published last month.

As chairman of the BCS Cobol specialist group and a member of the British Standards Institute Cobol working party, John Triance has played an important role in the British contribution to the shaping of Cobol in the future. In this article he summarises major Cobol developments likely to take place in the next decade.

Cobol is due for major changes in the next decade

By John Triance

TO many users Cobol must appear as one of the few static features in the fast changing world of computing. Cobol remains basically the same regardless of the programming techniques, operating systems and hardware used. Even the micros present only a minor hurdle to the stability of the language as standard Cobol compilers are already becoming available on them.

Of course, this tranquil picture of Cobol is somewhat exaggerated as those users who have recently changed from one compiler to another will be aware. But even these users are unlikely to appreciate the vast changes planned for Cobol in the 1980s. Much of the groundwork for these changes is taking place this year and a significant amount has occurred in Britain.

The main event of the year is the republication of the Codasyl Cobol Journal of Development. The Cobol JODs are always interesting because they document *the very latest version of Cobol — on which we can confidently predict that the compilers of the future will be based.*

They also contain a wealth of extra information on Cobol's history and philosophy of use, as well as explaining the major concepts of the language and providing a glossary of Cobol terminology.

In fact, I would strongly recommend any forward looking Cobol installation to acquire a copy.

The JOD is of particular interest because it is being used as the basis for the next standard of the American National Standards Institute which is scheduled for 1979. All Cobol compilers are based on one of these American Standards — ANS74 is the one currently in force. Ansi is not obliged to standardise all the features in the JOD; in fact on previous occasions it has omitted such features as variable length data items, asynchronous processing, and the INITIALIZE verb.

This time there are two major features which Ansi cannot afford to overlook: database and structured programming.

The database facility is a massive addition to the language with fourteen new verbs. It is based on the Codasyl scheme specified in the early 1970s, but since then there have been many changes, some cosmetic and others more fundamental.

The result is a network database system which is still the subject of heated debate. This will not however stop Ansi from incorporating it in the next Cobol standard.

The structured programming facility includes explicit terminators (such as END-IF) for conditional statements, an in-line looping construct (like Fortran DO and Algol FOR) and a multiway branching construct called EVALUATE.

The conditions by which the relevant path is chosen in EVALUATE can be sufficiently complex to permit the direct implementation of decision tables by this statement. Some long-standing deficiencies in the language have made the facility rather cumbersome in places but it will undoubtedly allow structured programs to be coded in a more readable way.

In addition to these major enhancements there are more than 50 significant differences between Codasyl Cobol and the current standard. Most of these differences are additions to the language, some of the more interesting of which are:

Reference modification. Any string of characters with a data item can be accessed by specifying the starting position and length of the string. Thus MOVE ADDRESS (10:6) TO .... would move from the data items ADDRESS the string of characters between positions 10 and 15 inclusive. The actual string can also be specified at run time by using identifiers in place of 10 and 6.

Enhanced modular programming. CALLed programs may be defined within the CALLing program instead of compiling them separately. This provides the opportunity for sharing data and files between different programs in the same run unit.

The shared data is either GLOBAL which is only accessible by programs nested within the program which defines it, or EXTERNAL which can be accessed by any coding in one of more of the Environment Division, the Data Division, and even the Procedure Division, these three Divisions have been made optional.

De-editing. Data items can now be moved from numeric edited fields to numeric fields. The compiler ensures that any editing characters such as full stops, minus signs and commas are automatically removed during the execution of the MOVE statement. This means that "humanised" input is now much easier to process.

Sequence preserving sorts. Records with equal keys can now be kept in the same relative sequence in a file during a sort operation by employing the WITH DUPLICATE KEYS clause in a SORT statement.

The REPLACE statement. A simple source text editing facility is now provided by a statement which allows the programmer to indicate any string of characters which is to be replaced by any other string of characters in the Cobol source program.

The various strings are specified in a new REPLACE statement which remains effective until the next REPLACE statement or the end of the program, whichever comes first.

This facility can be used for shorthand as well as limited conversion when the program is to be submitted to a compiler other than the one for which it was originally intended.

Making FILLER optional. In places where the reserved word FILLER is currently specified Codasyl Cobol now permits the word simply to be omitted. This should save a lot of unnecessary writing and transcribing.

The removal of certain anomalies. Punctuation rules are relaxed so that commas and semi-colons are simply interpreted by the compiler as spaces. The word IS has been made optional throughout the language. The limit of three on the number of dimensions of a table has been removed. A new limit of 48 is imposed by the number of different level numbers permitted in data definitions.

There are also alterations to Cobol which if adopted in the Standard will destroy upward compatibility. These include the deletion of the Level 77 entry, the deletion of the ALTER verb and the transfer of some clauses between the SELECT entry and the FD entry.

The 1978 Cobol Journal of Development is available in the UK from R. J. Chilton, British Computer Society, 13 Mansfield Street, London W1, price £7 for BCS members and £9 for non-members.

The journal is published by the Canadian government and further details can be obtained from the Department of Supply and Services, Material Data Management Centre, 4/B1 Place du Portage, Phase III, 11 Laurier Street, Hull, Quebec, Canada K1A 0S5.

UK playing major role in development of standards

THE UK's contribution to all this work should not be overlooked. Three organisations, namely The British Standards Institute (BSI), the BCS and ICL play a significant role in the development of Cobol.

ICL is a member of the Codasyl Cobol committee and as such has played a major role in recent years including producing the proposal for the enhanced modular programming described on the left.

The BCS through its Cobol Specialist Group was responsible for the proposal which made FILLER optional and continues to liaise with Codasyl. But its major contribution this year has been to keep Cobol users in the UK abreast of developments in the language with three important visitors from the US addressing its meetings.

Grace Hopper, who played such a vital role in the creation of Cobol, reported on what was happening and is likely to happen in Cobol and related topics. Don Nelson, the chairman of the Codasyl Cobol Committee, gave an interesting insight into the workings of his committee and indicated the items which are currently at the top of its agenda. He also gave his comments on a number of British suggestions for the improvement of Cobol. Finally Gerry Weinberg described how Cobol could be developed independently of Codasyl and Ansi by means of a macro preprocessor such as MetaCobol.

His ideas were of particular interest to a working party of the BCS Cobol group which is working on a macro facility for Cobol. This facility, if adopted by Codasyl, would overcome the many years of delay between the acceptance of enhancements by Codasyl and their becoming available to the user. It would also overcome most Cobol portability problems.

The BSI has a Cobol working group which meets about six times a year to monitor the progress of Cobol and give its views to the appropriate bodies. It has recently finalised its view on the form the next standard should take.

Besides stating which features of Cobol should be included in and excluded from the next standard, the BSI is also making a number of proposals designed to reduce the amount of variation among the different implementations of Cobol and to protect the user from those variations which persist.

Any individual Cobol user can also take part in the development of Cobol: Codasyl and ANSI consider any proposals sent to them. But anyone interested in participating in this process would probably find it more convenient to apply for membership of the BSI working group. This is done by contacting Alan Morrison. Tel: 01-211 8234.

Those Cobol users who do not wish actually to influence the direction of the language are still well advised to follow its progress. The changes being planned now will offer new opportunities for programmers in the next decade. They also pose a distinct threat to the future portability of the programs currently being written.

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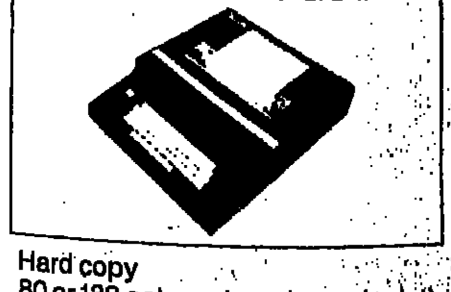


OP SPOT

By Bernard Allen

HINT OF THE WEEK

Controlling small library of tapes

THE size of an installation has a considerable influence on the role played by its operations staff; for instance, at the larger installations a librarian is often employed to control the movement and usage of magnetic tapes, whereas at smaller sites the operators are sometimes expected to perform this function.

On the subject of the latter, Deborah Palmer, an operator at the Worthing installation of the Gateway Building Society, sends the following hint to Op Spot:

"For sites which only have a hundred tapes or so," she says, "here is an example of a tape library which can be made up easily and quickly. It will add to the security of the installation and reduce the number of tapes which are lost or misused."

Deborah suggests that each tape should have two identifiers, one for its storage and another which identifies the file on it, states how often it is used, etc.

The latter might have the format ABBCDD, "where A indicates when the file is used (ie daily, weekly, monthly, etc), BB is a number given to the file', C is its cycle number and DD indicates the order in which it is used with the job."

The library should be supplemented by a pool of numbered and unnumbered scratch tapes, says Deborah. She goes on:

"The records could be kept up to date by writing any permanent or temporary changes in a book and using this for any future reference." She adds, "We use a similar method to that I have described."

Deborah points out that at her site only one file is recorded on each tape and adds that a modification of the system will be needed for installations where this is not the case.

Listen to ops' advice to achieve the best results

THE skill and experience of operations staff should be coupled with the expertise of systems programmers to ensure that the operating system is used to best effect and the throughput optimised.

This message is emphasised in a letter from Roy Cosway, who is a senior systems programmer at Cornwall County Council's Truro installation. He writes to Op Spot in response to a hint from Terry Stevens of the University of Sussex regarding the use of macros in the George 3 environment (CW, September 21).

Stevens' hint comprised two parts:

Firstly, he suggested the use of a macro in order to save the operator having to type a long message each time a printer cannot be engaged or allocated under George 3.

Secondly, he said that a macro called "PAY" might be put to good use in relation to the alignment of payslips.

Replies Cosway, "Some sites may not take too kindly to Terry Stevens' suggestions that operators create their own macros. We, for example, already have a macro called 'PAY' and so his second tip would cause that one to be overwritten."

But he praises Stevens' first tip.

"However, his first point is a good one and we have found that the operators at our site do similar things in order to save time."

"The trouble is that George 3 has so many combinations of messages. For example, if two printers are available when it is time to print the payroll, the system will request that payslips are placed on both of the units." In that event George 3 issues the following messages:

```
1) PLEASE ATTRIBUTE
   PAYSLIPS ON UNIT 014
2) PLEASE ATTRIBUTE
   PAYSLIPS ON UNIT 015
```

For practical reasons the operator will probably want to dedicate just one of the devices to the job. He continues:

"Frequently, it is necessary to restrict the output of payslips to just one printer and the operator must type in a long message to identify which of them is not to be used." That message is:

```
CD ATTRIBUTABLE
PAYSLIPS TO UNIT U14
```

Now, the programmers were not aware of this until the operators brought it to their attention. Then the situation was easily rectified.

Says Cosway, "Alerted to the problem by our operators we made simple modifications to the operating system; we changed the format of the printer requests so that the unit number comes first." Thus the above message is replaced by that which follows:

```
PLEASE         U14
ATTRIBUTE PAYSLIPS
```

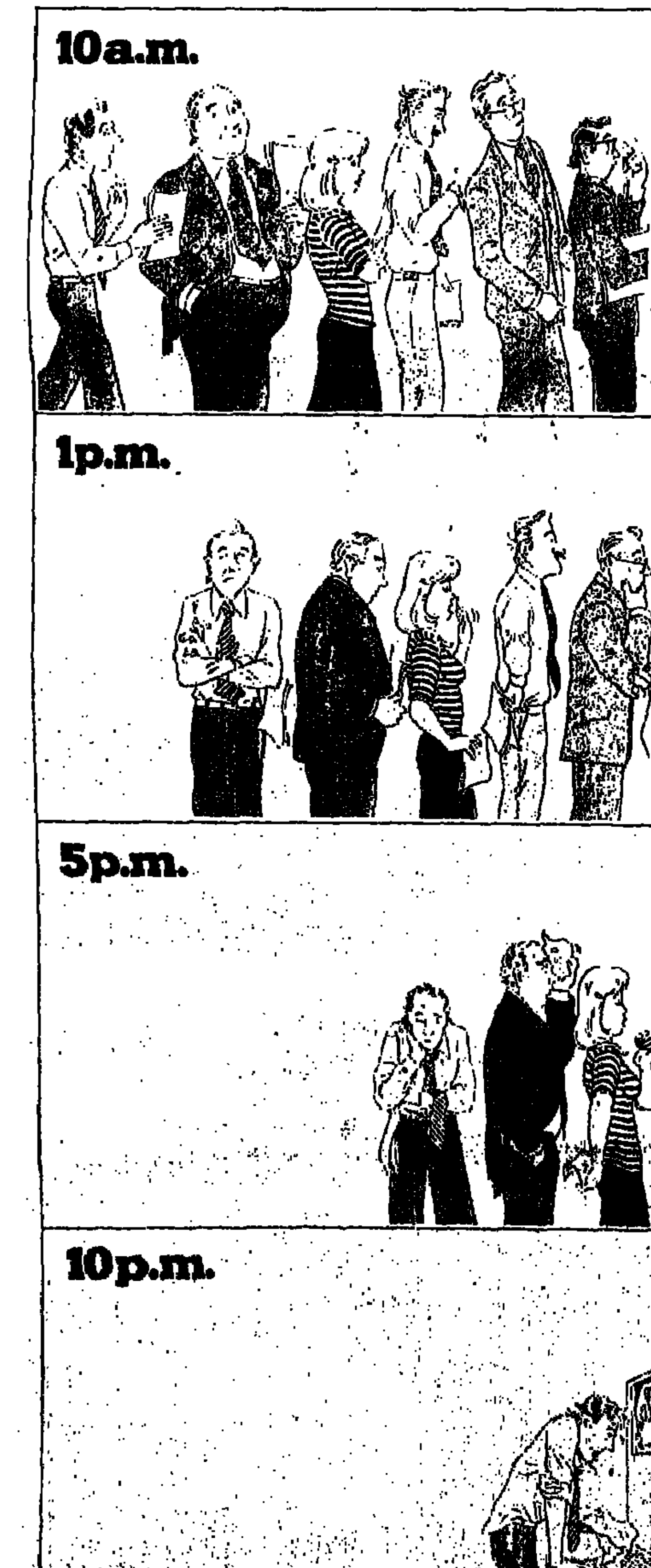
He continues: "Now the operator needs only to enter 'CD U14' in order to turn down the request."

Cosway concludes by stressing the benefits to be gained from communication and co-operation between operations and programming.

"Firstly, the operators are encouraged to make observations about the way in which things are run.

"Secondly, by acting upon their observations the site becomes much more efficient.

"I am surprised more sites don't listen to their operators. After all, they are the only people who actually see jobs running on the machine nowadays."



Some impressions from a newcomer

"AFTER starting my working life as a trainee accountant, I had a number of jobs, including a spell as a labourer on a building site (which was great in the summer but awful in the winter), and finally ended up working as a clerk."

So said a senior operator who contacted me in response to an Op Spot piece (September 7) in which I considered the position of a person looking to enter operations.

He continued: "Anyway, I got fed up with life as a pen-pusher and out of a morbid sense of curiosity, decided to give computer operating a try."

The next step was to visit a number of computer staff agencies to get an idea of the market-place.

"After trying the agencies, it became clear that there were plenty of vacancies and one place sent me along to three different companies for interview."

The interviews proved to be quite a mixture. He goes on:

"At the first of the companies, I had to take a three-hour aptitude test. Subsequently, I was given an interview and asked all sorts of odd questions. I turned down their offer of a job."

The second company was an improvement on the first:

"This time I did, at least, get shown around the computer room and quite liked the look of the site. However, I turned the company down because it would have meant a lot of travelling and I didn't have a motor at that time."

Third time lucky:

"I went *along to the installation and liked it from the very beginning*. The operations manager interviewed me and it seemed (and has since been confirmed) that he was genuinely interested in his staff's welfare."

Concerning operations work, he said:

"Contrary to what other members of the computing fraternity seem to think, operations work is interesting and demanding. We operators must think while standing on our feet in order to sort out problems and get the work through."

He mentioned that he enjoys working shifts, although he found it extremely tiring for the first few months or so. On shift allowance, he said:

"This is something I must moan about. Personally, I like working shifts but many others do not, and the general level of allowance is far too low."

Operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

COMPUTERISED jogging was the order of the day in Hyde Park, London, when 11,800 people of all ages took part in the Sunday Times National Fun Run. ICL provided six 1501 minis to keep track of the competitors in the 17 events and analyse the results by team and class.

Even the noting of competitors' numbers was automated — read by OCR wands. Gold, silver or bronze certificates were produced on line printers for every competitor.

ICL also provided 700 of the runners, and the starter of the first race was managing director Dr Chris Wilson. The Fun Run was in aid of the British Heart Foundation.

Services industry has openings for 2,800 graduates in coming year

OPPORTUNITIES for graduates in the computing services industry are looking better, careers advisers from 47 universities, polytechnics and colleges were told last week. According to the CSA, bureaux and software houses will be looking for 2,800 graduates over the coming year, having hired 1,890 in the last 12 months.

The careers advisers were at a meeting organised by the CSA to bring to their attention the scope of opportunities in services companies, pointing up the fact that the computer industry is not only composed of manufacturers.

John Ockenden, CSA president, described the services business, and Colin Rowland from Logica and Olga Charlton from Scicon gave descriptions of their careers so far, from senior and junior viewpoints respectively.

The reaction of the advisers present was enthusiastic. One, from King's College, London, said that he had not appreciated how big the field was, and that he intended to bring it to the attention of his students.

Ockenden pointed out that it was not only computer science graduates that firms hired. This could be seen from the fact that only 1,500 students graduated in computer science each year, compared to the 1,890 that CSA members currently hire.

N. Bonnett, from the Technician Education Council, suggested that the CSA could help considerably in the design of the computer science courses for the new TEC qualifications that are replacing HND and OND. The Council needs more advice from firms about exactly what training people need.

CSA director-general Alan Benjamin agreed that this co-operation would be welcome.

Marketing strategies

● From front page

within IBM itself as well as with the rest of the market.

"It appears to be an alternative to the 370," Seas board member Dr David Hartley of Cambridge University told Computer Weekly. "This and other competition within IBM should be good for the user in *the long run.*"

Orlansky commented: "IBM is very aware that technology is driving hardware costs rapidly downward and that the barrier to entry to the hardware business is falling all the time. The deep unbundling on the 8100 is the order of the day from here on.

"The new policy of IBM is to offer hardware at 'fire sale' prices and make up the revenue in unbundled software, where IBM is much stronger.

"The effect of this will be to spread the IBM software standard much further," he added.

Summing up the 8100 as a very effective entry into true distributed processing, Orlansky also thought that it would make life much tougher for minimakers like Data General with the Eclipse M600: "Because the 8100 allows users to avoid host connections altogether, it will also make migration to Systems Network Architecture take place that much faster."

Orlansky considered that its 64K RAM in 8100 could be another new trend at IBM, which has hitherto tended to rely largely on well-established rather than leading edge technology.

Forces' version

A FULLY militarised version of the Miproc 16 high speed microcomputer has been introduced by Plessey Microsystems. Known as the Miproc 16M, it has a processing speed of 3.6 million instructions per second.

Rory Johnston looks at the SRC distributed computing programme

ROUGHLY half of the funds for computing science research allocated each year by the Science Research Council go to its programme for Distributed Computing Systems.

The programme itself in a way represents "distributed research", in that it consists of a goodly number of projects which are separate but committed to co-operating in their overall objectives and to keeping each other informed about what they are doing.

Gill Ringland, industry co-ordinator for the programme, and formerly of CAP, points out that traditionally university researchers tend to "do their own thing" with little formal interaction with other related projects, and this, it seemed to the SRC, led to a good deal of re-inventing the wheel.

Therefore a structure was set up with a co-ordinating committee for the programme and a regular series of conferences and seminars for the researchers to tell each other about their work. Applicants for grants would get full feedback from the committee about its reactions to their proposals.

Facilities are also shared. As far as possible all the projects using linked microprocessors have standardised on the LSI-11, so that in effect a cupboard-full of the processors can be kept, out of which projects are supplied and to which hardware is returned when finished with.

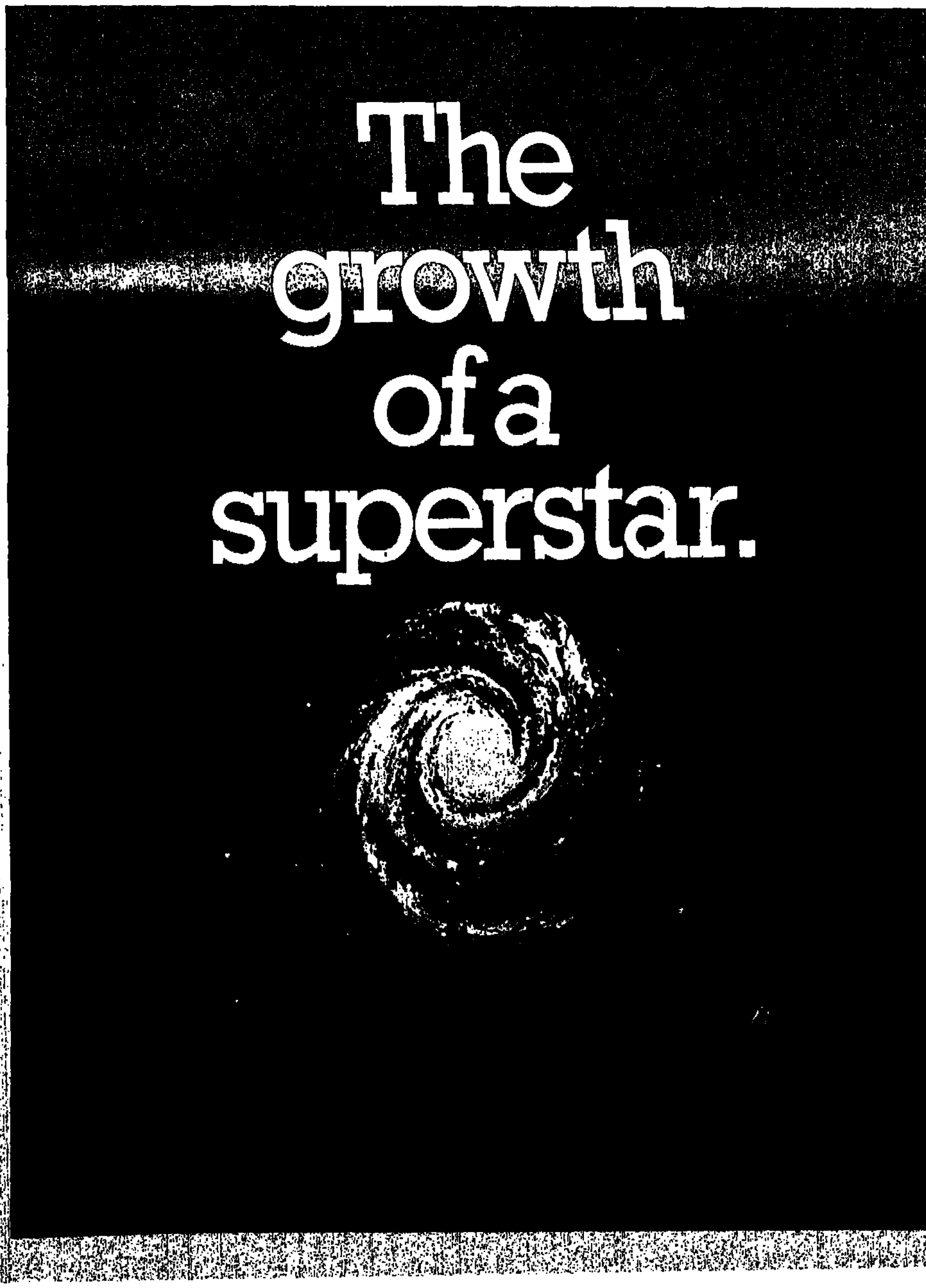
Also, the multiprocessor system built at Warwick by Colin Whitby-Strevens is being used as a testbed by workers from other universities wanting to try out their ideas without having to build their own hardware.

Similarly, a centre of expertise on real-time languages has been set up at York University. The researchers there have a grant to provide a "modular" real-time language as a tool for the rest of the programme.

The objectives of the programme are, broadly: to build prototype machines to demonstrate the principles of distributed computing; to develop software tools and techniques; and to promote co-operation between research establishments and industry.

By promoting small-group research in computing, the underlying aim ties in with the SRC's brief to maintain the standard of research in the UK and increase transfer of technology between the universities and industry.

Some £1¼ million has been committed to the programme so far this year (July 27).



PEOPLE AND EVENTS

Edited by Nancy Pocock

Systems company in Grand Met group

A NEW company was formed within the Grand Metropolitan Group in September. Its name is Grand Metropolitan Systems and it will offer systems consultancy, systems design and computer programming. The services are intended mainly for the other companies in the Group, but the company will also take in business from outside.

The systems company will be based at the Grandmet address in Oxford House, Uxbridge, Middx. But there will also be a branch at the Brighton address, Wellesley House.

Chairman of the new company is **Dilwyn Voyle**, who retains his responsibilities as director of information services for the Group, and as chairman of Grandmet Information Processing and Grand Metropolitan Planning.

Voyle's career in DP began with Colgate-Palmolive, where he became head of the systems division. He then became an associate of Booz, Allen and Hamilton, the management consultancy, and subsequently joined Paternoster Computer Services where he became chief executive. He has been with Grandmet since March, 1976.

Grand Metropolitan Systems' managing director is **Nick Timmins** who has been systems director of Grandmet Information Processing since February, and played a key role in the formation of the new company. Previously he was systems development manager with Rank Xerox, and before that was a systems manager with IBM.

Dick Manton has become assistant project controller of the branch accounting project in Barclays Bank's management services department. **Alex Scott** has been promoted to senior analyst/programmer within the department.

Dove

Davies

Manton

Scott

Ron Speed of Redifon Computers, previously South-East branch support manager, has become territory manager for the branch. **John Martin** has joined the company as personnel manager from Hardstock, part of the Babcock and Wilcox group, where he held the same position.

Atlantic directors named

AT the Atlantic Group, appointments have been made to the board of directors, and the sales and marketing operation has been reorganised.

Chairman of the Group's board is **Vernon Davies**, previously a director of Atlantic Computer Leasing. He will have special responsibility for investment and taxation matters.

The job of European sales director goes to **Roy Gibson**, who is replaced as UK sales director of Atlantic Computer Leasing by **Steve Mason**. Mason was formerly London and home counties sales manager with Atlantic Computer Leasing.

Atlantic Leasing's managing director is now **David Dove**, who was previously sales director of Itel UK.

Appointed to the position of operations director for the Atlantic Group's administrative and financial organisation is **Ken Jeffs**, previously a senior admin manager with the ICL Group. **Sieng Yin Cheng Kai On** becomes finance director of Atlantic Computer Leasing and Atlantic Leasing. She was formerly an auditor with Rowland Nevill.

Tony Rundle, previously technical manager with Compeda, has joined Nascom Microcomputers as software director.

Nigel Bailey, previously finance manager of Quest Automation, has become financial director of Minster Automation.

Wang division

THE office systems division of Wang, which markets word processing products, has moved to a new address. The address is: Chichester House, 278 High Holborn, London WC1. Tel: 01-242 8554.

General manager of the division is **Ray Redpath**. **Barry Winans**, formerly sales manager London, is now national accounts manager, and **Vic Kitchener**, previously a salesman, has become manager of the London branch. **Gill Mitchell**, former customer support representative, has become customer support supervisor.

Soccer Results

Division I

SIA 2, Comshare 4
Datasceno 1, Comshare 0
Datasceno 2, Jndpu 1
Gryphon 5, Rank Xerox 0

Division II

Lambeth 0, Altergo 0
John Lewis 2, Atkins 4
Altergo 5, Lambeth 0

Division III

Airfix 4, Datasolve 4
Airfix 2, 3M 0
Datasolve (WE) 1, Airfix 5

Division IV

Computer Weekly 0, UCSL 8
C. J. Bees 3, Bunzle D.S. 2

Division V

Sherwood C.C. 3, Hoskyns 0
Allen 3, CDC 5

Graham Clifton has left Marshalls Electronics, where he was general manager, to start his own microcomputer and memory programmer business.

David Tattersall, lately of Allied Suppliers where he was systems and programming manager, has become customer services consultant with System Aid.

Stan Packham, until recently marketing manager and manager of Boeing's computer centre in Luton, has been promoted to general manager of the commercial division of Boeing Computer Centres.

John O'Byrne, who joined Data Maintenance in January as head of the new Birmingham office, has been appointed national sales manager.

DIARY

OCTOBER 17

How to use computers in spite of computer programmers. E. A. Newman. BCS Croydon branch. Fairfield Halls, Croydon. 19.15.

Microprocessors. IDPM, West of London to Oxford branch. Bull Hotel, Gerrards Cross. 20.00.

OCTOBER 17-19

Computer measurement conference. Ecoma-6. European Computer Measurement Association. London.

OCTOBER 18

Personal computing forum. Demonstration, wine and sandwiches with CW. IDPM. Imperial Hotel, London WC1. 18.00

Recursion induction. Dr M. Brady. BCS Formal Aspects of Computing Science Group. Polytechnic of Central London, London W1. 18.30.

An introduction to structured programming. Gill Blay. BCS Cobol Group. BCS HQ, London. 14.15

Managing a small DP unit. BCS Kingston-upon Thames branch. Regional Management Centre, New Malden. 16.00. Details F. Vickers 01-894 4860.

Who represents the computer professional? E. Cluff, Tim Webb, Derek Harding. BCS Kingston-upon Thames branch. Regional Management Centre, New Malden. 19.30

Distributed data processing. Tony James, BCS Sussex branch. Gatwick Manor Hotel, Gatwick. 19.30

The future of large scale computers. Prof. Frank Sumner, BCS president. BCS Manchester branch. Manchester University Regional Computer Centre, Manchester. 18.30

Effects of technological developments on people in the industry and society in general. J. A. T. Pritchard. Dept of Computer Studies. Heriot House, Sheffield City Polytechnic. 14.00

OCTOBER 18-19

The computer revolution, industry and people, conference. BCS/IMechE/IEE/IProdE. Institution of Mechanical Engineers, 1 Birdcage Walk, London, SW1. Registration required 01-839 1211.

OCTOBER 19

Talk by Prof E. Dijkstra. BCS London branch. Waldorf Hotel, London WC2. 18.00

Optical image processing. BCS/Institute of Physics/British Pattern Recognition Association. Blackett Lab, Imperial College, London SW7. 14.00

Visit to Ministry of Agriculture. BCS Guildford branch. Guildford. 19.30. Numbers limited, contact C. P. Karney. 0483 70887

Prestel, the Post Office's viewdata. Bryan Dew. BCS West Herts branch. Heath Park Hotel, Hemel Hempstead. 19.30

Computerised medical records, the ethical position. John Dawson. BCS Coventry branch/BMA. Lanchester Polytechnic, Coventry. 19.30

Computer-aided farming. William Begg, Lorimer. BCS Aberdeen branch. College of Commerce Lecture Theatre, Aberdeen. 19.00.

OCTOBER 23

Can project management of automation systems be improved? — Colloquium. Institution of Electrical Engineers. Savoy Place, London WC2. 10.30

OCTOBER 23-24

Software management, conference. American Institute of Aeronautics and Astronautics/Royal Aeronautical Society/Technical Marketing Society of America. Royal Lancaster Hotel, London W2. Details 01-242 1045.

OCTOBER 23-25

Mini and micro forum. Online. Brighton.

Solving the dilemma of public networks

IN his Marketview, Fred Lamond outlined the "Dilemma of public networks" very well (CWI, September 14) but I cannot agree with his conclusion.

It may well be, that when all-digital telephone systems are available in 1986 or thereabouts, it will be possible to introduce an integrated voice/data network.

Between now and then, however, we need a public switched data network. It is inconceivable that an industrialised nation such as ours should be without such a network and PSS represents the best short-term solution to the problem.

The use of any switched network will involve additional costs, and packet-switching is no exception, but the advantages of a switched system are considerable and the costs will soon be recovered.

To capitalise on switched facilities we need standards and we need experience. These standards can only be generated and the experience acquired in an environment which includes a public network. It is here that EPSS has been so valuable.

The problems posed by packet-switching resulted in a study of the protocols and standards necessary in open switched networks. The resultant stratification of the standards means that all the "higher level" protocols which are now being developed are "network-independent" and the results will be usable over packet or circuit-switched networks.

There is certainly nothing in X25 or even the higher level protocols to prevent any manufacturer limiting the interaction between his system and others by inserting "secret software codes".

Given this degree of determination, they will certainly be able to keep themselves to themselves. Much good may it do them, but it is not a technique which is either aided or prevented by the nature of the switching system.

The article rightly quoted the high trunk channel utilisation as an advantage of packet switching. This is probably not a very important advantage in the United Kingdom.

Other advantages such as the ability to interwork between devices of different speeds and the ease with which a number of conversations can be multiplexed along a single subscriber link are probably more important.

The outstanding advantage of packet-switching in the next few years, however, is the rapid entry it gives us into the era of public switched data services along with most of the other European countries. This we need — and very quickly.

K. A. BARTLETT

National Physical Laboratory,
Teddington,
Middlesex.

The Editor welcomes letters on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. All letters are liable to be cut at the discretion of the Editor, unless correspondents state that their letters may not be cut.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

Major barriers to advances in DP technology

AT the moment when the grossly over-optimistic claims for computer power have fallen to the wager by a chess player that he would not be beaten by a computer in the next 10 years (just completed) it seems opportune for me to say that I am convinced that the arrogant claims of artificial intelligence workers and others have been a major barrier to advances in computer technology.

Those including myself, who have been trying for decades to secure advances in computer architecture have been seriously hampered by the pathetically naive, bullish claims for the future performance of the von Neumann computer.

It is not generally known that these computer propagandists are ignorant about computer technology and its potential, and so do not know that they are blocking rather than aiding, advance.

Six years ago in my book Computer Worship, I wrote: "... by worshipping the conventional computer, we inhibit development of better machines, which faithful computer worshippers must regard as a threat, as fraudulent super-gods."

I also wrote: "So long as (computer worshippers) thought they had a dangerous wizard in their midst, they would never have a dangerous wizard in their midst."

I am pleading to computer worshippers to put their energies into thinking about and helping to push ahead with improvements in computer architecture.

By this I don't mean cooking up fancy gimmicks in high level software. I mean they must sit down and learn about the hardware, which they have totally ignored, and think about the computing power improvements that we can get from hardware advances.

Start by finding out what a context addressable memory is. Then try to find out what associative processing means. Then in time we *will* have a machine that plays a reasonable game of chess.

IVOR CATT

St Albans,
Herts.

Support for latest Tymnet system

WE have read with great interest Hesh Wiener's article on AT&T's planned Advanced Communications Service (CW, August 17). It calls for some comments.

A large part of the described ideal service is already operational with the Telenet and Tymnet networks which are not even referred to. In fact the description of an ideal network is very similar to the present Tymnet service with its On Tyme message switching service. We are sure that in the next few years, well within the time scale for the introduction of AT&T's ACS, Telenet will provide an equal service.

Another interesting point is that this type of network was proposed by Tymnet for the British Post Office. It was perhaps because Tymnet did not fit in with the X25 protocols favoured by the PO that Tymnet was not among those to put in a tender.

The general aim of ISDCA is to create national and international networks with multi-protocol capability, using equipment able to offer message switching and data processing facilities.

That is why ISDCA supports the use of the latest Tymnet system and welcomes competition from operations such as Telenet. It also welcomes AT&T's ACS, so well presented in Mr Wiener's article, for it means the entry into the international network field of AT&T with Digital Equipment hardware, a brilliant and powerful combination.

Comment on the various network systems and their development would be welcomed.

HERVE DUMESNIL ADLEE

International Secretariat for
Data Communication
Applications
28C Rue Henri-Simon
788000 Versailles
France

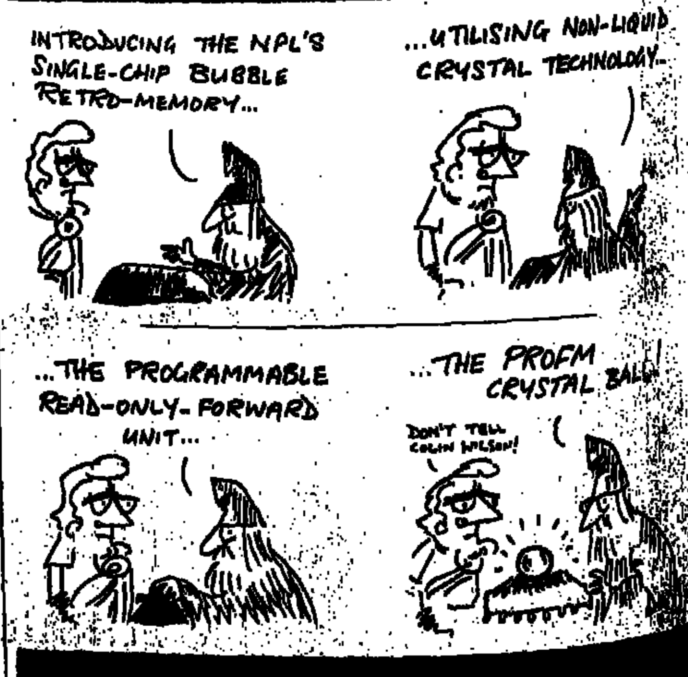
Aptly named

I NOTICE that one of the directors of Logica is listed as "A. Macro". Are there similar apt names elsewhere in the industry?

D. W. BARRON

Department of Mathematics,
Southampton University.

Liveware Saga *by Don*



CONFERENCES

THE international symposium on mathematical programming sponsored by the Mathematical Programming Society is a triennial event which will take place next in Montreal, Canada, on August 27-31, 1979. Contributions on all theoretical, [illegible] and applications aspects of mathematical programming are invited. Abstracts of up to 200 [illegible] English, minimising mathematical [illegible] tion and containing two [illegible] words, should be sent [illegible] 1979 to the Symposium [illegible] International Symposium [illegible] cal Programming, [illegible] West, Montreal, Quebec, Canada.

COMPUTER WEEKLY EDITOR MALCOLM PELTU TALKS TO EMPLOYMENT MINISTER ALBERT BOOTH ABOUT HOW NEW TECHNOLOGIES WILL AFFECT BRITAIN'S WORKFORCE

Minister optimistic on jobs — but it's an 'act of faith'

DESPITE warnings from many quarters that the "micro revolution" could lead to massive unemployment and industrial disaster in Britain, Employment Minister Albert Booth remains "enormously optimistic" that in the long run the new technology will prove to be of great benefit to the country as a whole.

He is also honest enough, unlike some pundits in this area, to admit that his optimism can be called "an act of faith" rather than being based on a bed-rock of hard factual projections of the total impact of technology in destroying some jobs and creating others.

Booth's optimism is based on his belief that "in this country we have a sense of partnership between organised labour and government which should give us a better opportunity than any other country to work out some of the problems inherent in the introduction of new technologies."

His long-term optimism is tempered by a worry that with the current media stress on the negative employment impact of microelectronics, the new technology is still seen by some in terms "not very different from those in which the Luddites saw new machinery — as a threat to jobs rather than as a means of satisfying social needs and building up employment opportunities."

The introduction of advanced technological processes, he stressed, is unavoidable if Britain is to maintain and improve its performance in world markets.

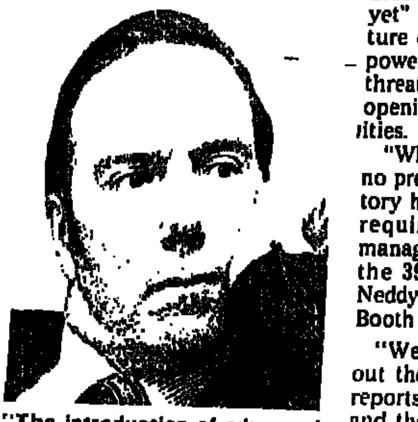
"The realities of world competition mean that we must use labour more efficiently and effectively, boosted wherever necessary by the implementation of automated aids," he said. "There is no way we can try to employ more people using outdated processes."

And Socialist Booth, just like any capitalist manager, has no doubt about why advanced technological processes are often introduced.

"Obviously the best use of modern technology and the incentive to use it must be that it is worthwhile going in for labour saving."

In order to gain workers' willingness in going along with the employment changes flowing from the use of new technology, Booth believes that legislation such as that covering employment protection can play an important role.

This view of the labour saving objective of new technology would seem to confirm some of the gloomier predictions about the way that the introduction of information technology could lead to vast increases in unemployment.



"The introduction of advanced technological processes is unavoidable."

What evidence does the government have to confirm or deny these predictions?

Historically, Booth pointed to a study by the Manpower Services Commission which showed that over the last decade there was a reduction of one million in those working in manufacturing industry, and an increase of one million among those working in services.

The reasons for this shift and its dependence on the general world economic environment rather than technological change are arguable, said Booth, although it does offer a true picture of what has happened.

However, predictions of future employment changes, he said, are based on "challengeable assumptions," and Booth said the government had no figures "good enough to publish as yet" which give a realistic picture of both sides of the manpower planning equation — the threat to existing jobs and the opening of new job opportunities.

"What we do have now, which no previous government in history has had, is the manpower requirement estimates of managers and trade unionists in the 39 areas covered by the Neddy sector working parties," Booth explained.

"We are currently working out the full implications of the reports of these working parties and then we will have a better idea of what is happening.

"However, some clear pointers are already emerging, particularly in manufacturing industries. Most working parties indicated that even going for the best possible share of world markets would result in the use of more capital intensive processes and less people operating those processes. In other words, we will be using fewer people to produce the same or increased output. Only a minority of working parties have contradicted this.

"This means we will also need to train more people to design and build plants and less to operate them."

When asked about the likely employment impact of information technology in the office, Booth said, "Frankly I don't know what will happen although clearly there is the potential to make an enormous impact in office work."

How does Booth react to the view of ASTMS general secretary Clive Jenkins (CW, September 14) that information technology means it will no longer be realistic to aim for full employment and that we should start planning for a "leisure society."

"My objection to the way Clive Jenkins and others view the 'leisure society' is that it puts out of phase the creation of greater wealth and the reaping of the rewards," Booth commented.

"I agree with Clive that the use of the best modern technology in an intelligent, well organised, socially responsible society could throw up a way of life in which people spend less of their time doing things to earn their bread and butter.

"But it is all very hypothetical unless it is coupled with clear-cut ideas about how we find the social and political means to ensure that the wealth is diverted to areas which will create effective services that might be demanded by people with more leisure time."

After this mild castigation, Booth laughed. "You know I usually criticise my fellow trade unionists because they spend 99% of their time on day-to-day questions and only 1% looking to the future. Now here I am criticising some unionists because they are looking too far into a hypothetical future.

"In fact, my optimism about our ability to cope with technological change stems from the fact that so many trade unionists are beginning to look to the future and can see the benefits of the new technology so that the argument becomes not about *whether* we should make changes but *what changes* need to be made to achieve the best results."

But if Booth sees a relatively rosy picture in the future, has not Britain had a bad record in maintaining our industrial competitiveness in the past?

Booth stressed that, while there have been failures in some areas of British industry to introduce new methods, we have "led the world" in others.

In the areas where British industry has not succeeded, Booth believes one of the main faults has been in the way some management have made investment decisions without taking into account the views of their workforce on the employment implications.

"I believe management in some board rooms have sat down and decided on investing in a marvellous new plant without ever consulting the unions representing the organised majority of workers on the employment implications of the new development.

"Very often, the impact in the workforce is not considered until after money has been committed to a project and sometimes not until after work has started on building the plant.

"Discussions about manning levels and employment implications should take place at the same time as discussions about investment."

In order to emphasise the importance of this requirement, Booth believes legislation should be introduced which guarantees that where "recognised independent unions can come together in any plant, or in any company, and agree among themselves how they can be represented in discussions with management, they should have the right to be collectively consulted on any corporate changes that will have an impact on employment." (see page 1).

If unions can perceive the long term benefits of new technology, Booth believes, they will willingly accept the challenge of working within the democratic process to find a way in which new technology can provide the means by which society is provided with a better lifestyle in terms of services, like better schools, better hospitals and better homes etc.

"Sense of partnership should give us a better opportunity."

'Latest fashion'

THE current obsession with the "micro revolution" has caught the imagination at this moment for no particular reason other than it just being the "latest mode or fashion" according to Albert Booth.

"The logical time to have become concerned about the impact of computers and electronic technology in the employment field was probably a few years ago when we started arguing about the introduction of electronic telephone exchanges.

"That was a breakthrough, because it made savings in the number of people needed to operate the equipment as well as to make it, whereas previous developments required as many, if not more, people to operate new equipment.

"Perhaps one reason why there is more concern now is that people are realising that the employment problems in this country stem to some extent from demographic changes; the fact that there are many more people coming forward to seek work."

'Urgent need for computer training'

THE Department of Employment has asked the industrial training boards to give their best estimates of future skill needs in their areas and to "show convincing proposals as to how far training schemes they will run in the next year will make provision for these future skill requirements" says Albert Booth.

He accepts an urgent need to train people in areas where there is currently a shortage of skilled manpower, such as in the computing and engineering professions.

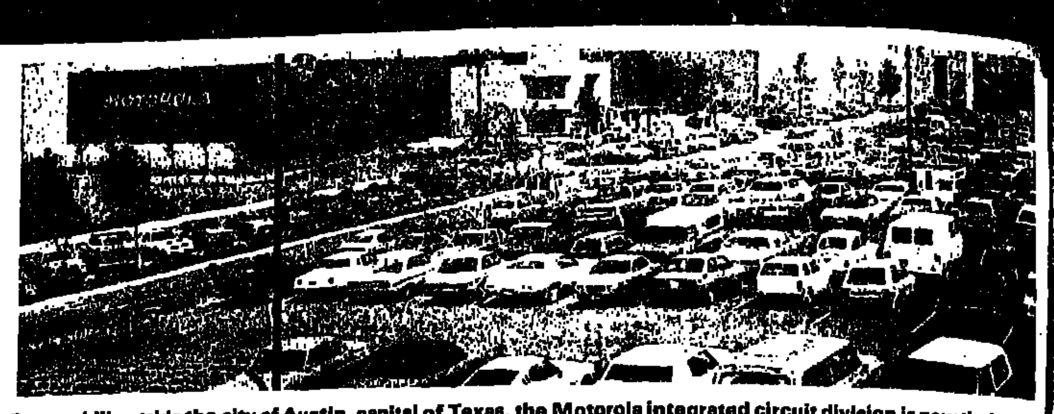
But he says, "We can't bypass the traditional training and education system entirely. There is never really a right time to change the training process because some skill cannot be taught on a crash six-month course.

"It is important, however, to take the right decisions now even if it takes four or five years to reap the benefits and that is why we have undertaken this manpower planning exercise with the training boards.

"At the same time, we must make the training system more flexible, enabling people to enter training for new skills not only in their teens but in their 20s, 30s and 40s."

America, seen in the forefront of all technological wizardry, has led the world in the exploitation of semiconductor technology. From the "single chip" transistor, there has developed a plethora of "systems on silicon" that extend now up to the genuine, if somewhat puny, computer on a chip. But in software, and the overall skills of applying this technology, the UK has distinct advantages over the US, and should be exploiting them to the utmost.

Who says so? One of the "Grand Wizards" of the American semiconductor business, Gary Daniels, manager of microcomponent design at Motorola in Austin, Texas, who talked there to Micro News editor Martin Banks.



Set on a hill outside the city of Austin, capital of Texas, the Motorola integrated circuit division is now the base for all the company's activities in microcomputing and memories.

'The real problem is that most people don't realise that the real problem is software'

AS manager of microcomponent design for Motorola Semiconductors at Austin, Texas, Gary Daniels is in one of those rare positions that give a total overview of what is both right and wrong with the global semiconductor scene, and he is not altogether happy with what he sees.

Large sections of the semiconductor industry have changed from the business of producing straightforward components, such as gates and shift registers, so to speak by the barrow-load, to manufacturing what Motorola now refers to as systems on silicon. It is however, looking to produce these systems too by the barrow-load.

With the development of the early microprocessor devices, and the rapid growth in the number of progeny that have stemmed from that development, the semiconductor industry has started in on a whole new ball-game. "The business," observes Daniels, "failed to realise what it had come up with, and it is only just coming to terms with what it has created."

This background has now created a situation where there are several fundamental problems that need to be solved, and the solution by and large rests in the hands of the semiconductor industry. To some extent this might be taken to imply blame to the industry. This should not however, be the case, for the semiconductor is one of the few to take the bull of technological development possibilities firmly by the horns. But by this very act it has pushed the capabilities of the technology, and the devices that are based upon it, beyond the scope and understanding of many engineers working in potential application areas.

Daniels is acutely aware of this. "Our biggest problem is still educating engineers to the fact that there is a micro at all," he says, pointing to the fact that, up till now, educational support has not been one of the semiconductor industry's strongest points.

But to make the best of any application, the prime need is for a strong supply of software skills to be available, and here Daniels feels, lies perhaps the most fundamental problem of all. In a convoluted crystallisation of the situation, he says, "The real problem is that most people don't realise that the real problem is software."

There is currently a great shortage of software engineers, which Daniels considers a more appropriate definition of the job function than mere "programmer." This is particularly so in the US, where it appears the situation is reaching critical proportions.

In the UK, however, we have a definite lead in software. According to Daniels, the UK has a good lead in the development and use of software skills for micro-based systems, which should be exploited. In the US, it seems that concerted exploitation of such skills is some way off, for as Daniels puts it, "In the US, many people don't even realise there is a shortage of software people."

To help overcome these problems, one area that is being seriously investigated by Motorola is the scope for firmware modules. While theoretically overcoming the shortage of software development skills by providing "plug-in" programs, it also has the obvious advantage to a company like Motorola of increasing the opportunities for volume selling of silicon-based products.

"We have to have software modules to make the programming task easier," says Daniels. As an example of this, he points to the number of times software writers "re-invent the wheel" when producing programs, rewriting potential modules time after time. Such modules — from Motorola's point of view obviously in read-only memory form — will be a natural development, he feels.

Already Motorola, in common with other semiconductor manufacturers, is working on 64K bit ROMs that mount 8K byte Basic interpreters, and Daniels sees the scope for having structured modules of firmware that work with these interpreters.

This, however, means that the semiconductor business is again creating new frontiers, so it is likely that any developments in this area will be small to begin with. A probable starting point is something like a maths routine in ROM, rather than a complete applications package. The key problem here, for the semiconductor companies, will be learning to walk before they can run.

As Daniels puts it, "software reliability is a real problem, and as a firmware alteration would be difficult and time consuming to make, the software will have to be RIGHT before committing it to silicon."

Of more immediate import to Motorola in making software more accessible for the micro, is the recent announcement that the company's MACS 16-bit device, when it appears early next

● Turn to page 17.

Intel moves into programmable instrumentation systems market

WITH a growing acceptance of IEEE 488 as a standard interface for programmable instrumentation systems, Intel has announced its intention of entering the market with a two-chip interface set for low-cost implementation of this standard.

Sampling of the set is due to start within the next two weeks, according to Peter Jones, peripheral products marketing manager for Intel in Santa Clara, California.

The set consists of a talker-listener, known as the 8291, and a controller, called the 8292. The former is capable of performing all necessary interface functions except for those of controlling the interface bus and sending commands. In operation, it is situated between the instrument and the interface bus, and handles all the communications between the two. These include data transfer, handshake protocol, addressing procedures, service request and serial and parallel polling schemes.

As the interface standard is byte serial, bit parallel in operation, the 8291 has been designed with 16 registers, eight of which can be written into, while the remaining eight can be read from.

Without the controller device, the 8291 requires an additional four bipolar bus transceivers to provide the 48 milliamp bus control drive capability that is not readily available with MOS devices.

The controller itself, the 8292, is based on Intel's universal peripheral interface chip, which has been specifically programmed for the task.

It exercises its control capability by activating one of the bus management lines, thereby indicating that the bus data lines should be interpreted as command bytes.

A system may include several controllers in its make-up, but only one may be active at any time. Another feature of the device is the capability of sending messages such as interface clear via the bus management lines. Each system must have a system controller, which must remain in an active state throughout operation of the interface. This device is not necessarily identical to the controller in charge at any given time.

Whichever device this is, it has the additional function of monitoring the service request line of the bus, in which mode it conducts two types of bus polling. These are the serial poll; in which the polled devices respond with status bytes, one device at a time, and the parallel poll, in which up to eight polled devices respond in parallel by sending one status bit each.

A total interface package for the IEEE-488 bus will consist of one 8291 talker-listener, an 8292 controller, five TTL packages, and five bus transceiver packages.

Computer Centre cuts prices

CONTINUING to cut prices of hardware for the small computer and hobby markets, Computer Centre of Fleet, Hants has knocked some money off its list prices for both 8K byte static memory boards, and floppy disc drives.

The 8K boards, previously priced at £85, have now been reduced to £79 in kit form, while the floppy disc drives, which were sold at £250, are now available at £195.

Award to Dr Gordon Moore

THE IEEE Computer Society in the US is to present the W. Wallace McDowell Award to Dr Gordon Moore, president of Intel, for his "outstanding insights and leadership in the microprocessor and semiconductor memory fields."

It will be presented at Compsac 78, the Society's second international computer software and applications conference, to be held in Chicago, from November 14 to 16.

Chip from NEC

A MICROPROCESSOR chip that is pin compatible with the Z80 has been produced by the Nippon Electric Company of Japan to its own design and therefore without a licensing agreement.

Called the μ PD780, the device is marketed in the UK by NEC Electronics Europe of Motherwell, Strathclyde and is priced at £15.65 each or £9.25 per 100.

Additions to Mostek range

THREE additions have been made by Mostek to its range of add-in memory boards, and the company has appointed two UK distributors.

The distributors are Zygal Dynamics of Chesham, which will be handling Mostek boards aimed at the DEC range of minicomputers, and Real Time Control of Watford, which will handle products for the Data General market.

The new boards are the MK 8004 family, which offers up to 128K bytes x 21 bits, for the Data General Eclipse range of hardware. The 21 bits include 5 bits of error checking.

For DEC equipment, there is the MK 8005. This is aimed at the LSI 11/02 and is a dual-sized board offering a maximum capacity of 32K bytes x 18 bits. Also for DEC hardware is the MK 8011, which offers PDP-11 users up to 64K bytes of 150 nanoseconds access time memory.

'Most people don't realise real problem is software'

● From page 16.

year, will support Pascal as its first high-level language (CW, September 7). Daniels certainly feels that this move has long-term significance for Motorola, for he claims it is the best high-level language around at present.

In addition to having a real *time capability, it is a good teaching language. "Many students are already* coming out of college fluent in it," Daniels points out.

DANIELS . . . "our biggest problem is still educating engineers to the fact that there is a micro at all."

Programming in high-level languages is going to be essential in the future, he feels, even for industrial applications, and the capability of 16-bit devices to use them effectively will eventually supplement the 8-bit device in the market, when the price is right.

This view is borne out by Lee Melugin, international marketing manager for the NMOS microcomputer group in the company.

"There is a 4-bit market still," said Melugin, "but the 8-bit has eaten into this. In the same way, the 16-bit will eat into the 8-bit market, even if it is a sledgehammer to crack a nut." Some of the nuts that could be cracked in the long term, according to Melugin, are applications in domestic white goods and toys. The use of 16-bit devices here will, however, be heavily dependent on the unit price, and this will be determined to a large extent by their impact and acceptance in their immediate applications areas.

These are seen mainly as the communications and process control markets, where the number-crunching capabilities of devices like Motorola's MACS will offer definite processing and cost advantages over both 8-bit micros and minicomputers.

According to Melugin, the first silicon for MACS, now officially to be known as the 68000, is expected by "December 32nd." The company is hoping it will be available this year, but it will probably be very early 1979. He is hoping the part will follow in the footsteps of one of his other responsibilities, the 6801 processor.

Shown in public for the first time at the recent Wescon exhibition in Los Angeles, the 6801 worked first time when the initial sample batch was produced at Austin. Only two minor design modifications were needed to meet the target specification. Melugin is hoping that the 68000 will be the same.

To produce a part like this however, poses problems, and echoing Daniels' views, Melugin feels it will continue to do so for some time. The major one he sees is the need for more applications. "Where are we going to use the capabilities that are being produced?" he asks. "We haven't got there yet, but we are going to outstrip the ideas of the users."

Like most companies in the semiconductor business, Motorola at Austin has its share of expatriate "Brits", and one, ex-Ferranti man Peter Bagnall, has responsibility for marketing MOS memories for the company. In this position he is very aware of recent activity in the UK, in the shape of Inmos and the GEC-Fairchild joint venture. He sees neither pulling off the trick of getting its products and production processes right first time, which he feels will be the essential first step towards long-term success.

He bases this opinion on the recent history of Motorola's East Kilbride, Scotland, facility. Although in existence for some time, the plant has recently been extended, and with the company's existing background in its own process requirements and capabilities, it has taken nine months to get the new plant up and running and producing acceptable yields.

This time-scale he feels is good going, and has been achieved with an existing team of people who know what they are doing. Both Inmos and GEC-Fairchild will have the added problem of new teams, and so he feels that neither will come to the market on time, especially in the high volume, [illegible] sensitive memory [illegible]

Artec word processor imported from US by Data Dynamics

ANOTHER word processor has entered the crowded UK market, this time the Artec Display 2000, which is being imported from the US by Data Dynamics of Hayes, Middlesex. This is a stand-alone printer machine with a single-line display and a separate floppy disc unit.

The printing unit is Diablo's word processing daisy-wheel printer with metal wheels: this provides proportional spacing and right-hand justification as well as a choice of type founts. The display is Burroughs' gas plasma device, 37 characters wide, mounted on the front of the printer above the keyboard.

Text is stored on either one or two Shugart floppy disc drives in a pedestal that stands beside the typist's desk. Software as well as text is held on disc, so functions can be updated or added to a certain extent without the intervention of an engineer. The processor is the Intel 8080 micro.

The basic Artec 2000 costs £6,950.

Benjamin to speak on SPIN

THE recent SPIN conference on computing in the Third World is the subject for the next meeting of the BCS Specialist Group for Developing Countries. Speaker will be Alan Benjamin, director general of the Computing Services Association, and the meeting is to take place on Wednesday, October 25, at the London School of Economics starting at 6pm.

Lobb to head US subsidiary

A NEW subsidiary, to be called Northern Telecom Systems Corp, is being formed in Minneapolis to bring together the Canadian telecommunications company's two recent US acquisitions, Data 100 Corp and Sycor Corp.

John Lobb, former chairman and chief executive of Northern Telecom in Montreal is to be chairman and president of the new subsidiary. He will also continue in the post of chairman of Modcomp. Northern Telecom has no financial interest in Modcomp.

Food for thought

TOP men in the energy industry will be giving their views at a series of special lunches in conjuction with The Energy Show at the National Exhibition Centre, Birmingham, from February 19-25, 1979.

The lunches will be at the Metropole Hotel adjacent to the NEC, where equipment designed by more than 150 leading manufacturers in the energy industry will be on display.

Sir Derek Ezra, chairman of the NCB and chairman of the British Institute of Management, will address the lunch on Tuesday, February 20. Sir John Hill, chairman of the UKAEA, will speak on the Wednesday, Sir Denis Rooke, chairman of British Gas on the Thursday and Mr H. B. Greenborough, president of the CBI, past president of the Institute of Petroleum and deputy chairman of Shell UK, will address the concluding lunch.

Sponsored by the Institute of Fuel, details of The Energy Show may be had from the organisers, Trident International Exhibitions, Abbey Mead House, 23a Plymouth Road, Tavistock, Devon. Tel: 0822 4671.

COGARVIEW

In the middle of a false printer boom

THE computer market is about due for one of its periodic dramatic shake-outs, and if I read the signs correctly it is the printer manufacturers, the independents, that is, who are going to suffer.

Now this may seem an odd assertion in view of the printer market's recent strength and the bullish remarks of Dataproducts spokesmen around the world. Certainly there's plenty of life left in printers and in the likes of Dataproducts, yet. But I think that a printing bubble has developed and it is time that it burst.

In America alone there are 96 vendors of printing equipment at the present time, and a staggering 309 models or model families. The growth rate has been something around 40-50 per cent recently and printer prices are reckoned to be falling by seven per cent a year. Yet the vast sales figures implied in these statistics do not represent a notable diversity in technology. In spite of the 96 vendors, there are only about 12 identifiable printing techniques involved, and many of them have been around a long time.

To me these figures spell impending trouble. I just do not see how computers can give an economic pay-back if we go on creating printers at this sort of rate. After all, one of the main reasons for buying more computational power is to do less printing. But to look at the relative figures for processor and printer sales over the past year you'd never believe it.

We are, I think, in the middle of a false printer boom — a sort of freak-peak. At the top end of the market users are still brute-forcing away in a style that demands enormously extravagant, high-speed printing. Further down the market, simultaneously, distributed data entry, small business systems and terminal-based systems have suddenly created a big new end-user market that didn't exist before.

At the same time microprocessors have allowed printer manufacturers to add some useful, and some pretty redundant, new features to largely unchanged models to create the impression of a new printer generation.

It's common sense to use a micro for control with almost any printer, and the addition of a diagnostic capability will be specially attractive in applications where the printer will be sited remote from the computer and very probably in the charge of someone without technical knowledge. Some sort of diagnostic contribution to reducing service calls and increasing MTBF is bound to be welcome.

There has to be a huge short-term market at the lower end of the price scale. Already, in the US, attractively priced CRT/printer packages are being put together with buffer stores so that the CRT can be used for editing the next page while the previous page is being printed out. The designers are thinking in terms of printers which are CRT peripherals, rather than computer-peripheral printers which have to be kitted out with a clumsy interface for use with CRTs, as in the past. It's a sign of maturity.

At the top end of the market there has to be a strong position for the genuine new generation — the laser printers. I expect to see the prices drop sharply in the next five years until they are competitive at most levels of the market, displacing a lot of more traditional equipment.

But if my analysis is correct, there is going to be a big problem of over-supply in two or three years' time. A lot of small entrepreneurs have jumped on the printer bandwagon recently, believing they glimpsed a market that was both technologically stable and capable of sustained growth.

You have to be sympathetic to their aspirations. The last few years have been bad for small entrepreneurs on the whole. Micro-technology has eclipsed electronics; the small man can only sit back and watch the companies with heavy technology investment eating up the market.

Software is pretty hard to sell. The service industry isn't too healthy any more. So what's left? Inevitably the small people get into a scramble for anything the majors can't or won't make in sufficient volume. We saw it with floppy discs (and where are they now?); we're seeing it with printers.

The tide is running against impact printing in my view. Not only are the newer, alternative technologies sexier, they are also quieter (important considering the growth of distributed printing) and more reliable.

Impact printers are still benefiting from a curious quirk of the law in many places, which states that all legal copies of a document must be produced at the same time. That is, copies printed serially rather than simultaneously are often not acceptable in law.

They will continue to benefit for a little while yet. Lawyers are very conservative people, and they are also wary of technology. As far as they are concerned, if you print one copy and then print another you have the capability to alter the contents between the two copies.

But they are under increasing pressure to drop this requirement, and common sense will prevail in due course. It is like a re-run of the great controversy of the 1950s over whether mag tape could safely be accepted as an archival medium.

Central-site printing generally has to be on the decline. As you try to speed up workflow with distributed data entry, for instance, it is simply self-defeating to retain a central printing plant. What is the purpose of printing umpteen copies at enormous speed which then take four days being carted off to their various recipients?

But of course what we are still awaiting is the realisation that far too much printing is being done anyway. When you can print 40,000 characters a second, as you can with laser models, the temptation to print out every last word can be indulged without sweat. But to what useful end? How many people, confronted with a 500-page inventory warm from the printer, can do anything useful with it?

The computer is supposed to be there to help you locate things, not bog you down in reams of irrelevant information.

Once that realisation begins to dawn, the printer market is on the way down. It won't happen quickly, or yet. But I'm still hopeful that it will happen soon enough.

In the meantime a few fortunes might still be made, no doubt. But I couldn't say I was happy at the prospects of a market which is largely dependent on users' continuing to make mistakes. For it is a mistaken concept of the need for hard copy in all circumstances on which the printer bubble rests.

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The salaries for these positions will be dependent upon experience and will be within one of the following ranges:

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TRAINEE COMPUTER OPERATOR £2197–£3396 per annum inclusive

Applications stating full relevant details and present salary to the Group Personnel Officer, C.E.G.B., Sudbury House, 15 Newgate Street, London EC1A 7AU, by 19 October 1978.
Quote Ref. ES/320.

CENTRAL ELECTRICITY GENERATING BOARD

Salary up to £4K inc. shift allowance.

Applications are invited for the position of Computer Operator in our Crawley computer installation. The position is an important one on a two shift system using an ICL 1902T 80K machine operating under George II.

The installation is changing rapidly, and will soon be installing a 'wavetek' audio response system which will eventually be used by all 250 dealers in the Toyota network.

Ideally we would require an applicant with experience in this field for which a salary of c. £4K will be paid. However, the company will consider an enthusiastic trainee whose salary will depend upon past business experience, educational qualifications, and age.

Applications should be addressed to:–

Maureen Cross, Toyota (GB) Ltd.,
320 Purley Way, Croydon CR9 4HB
or telephone 01-681 1921.

Computer Operator/ Trainee

TOYOTA

Everything keeps going right

1st Class Computing Opportunities

FOR HOLDERS OF G.C.E. QUALIFICATIONS, GRADUATES & EXPERIENCED PROGRAMMERS

The Computing Services Division of the British Railways Board deals with a very wide spectrum of computing applications, ranging from batch financial application to one of the largest on-line systems in the U.K. Opportunities will be given in the following areas:

Mini-computer applications
Conversion from ICL 1900 to ICL 2900 machines
Computer graphics
National financial applications

This work is technically challenging and will provide a sound basis for a career in Data Processing.

A short formal training programme will be given followed by practical training. Selected candidates will be assigned to BR Computing Centres in Crewe, Nottingham or Reading.

Applicants will hold a Degree (or equivalent qualification or a minimum of two good GCE 'A' levels plus a good GCE 'O' level in English) for the junior appointments together with two years' programming experience for the more senior positions. Salaries will range from £2453 to £3633 for the junior posts and from £4218 to £5184 for the senior posts.

Requests for application forms should be sent to

HQ Staff & Services Manager
222 Marylebone Rd
London NW1 6JU
Quoting ref
PROG

A JOB WITH A FUTURE . . . as a

Programmer £4800 p.a. or Operator £3850 p.a.

If you want a job that has real career prospects in dynamic, but friendly surroundings then LRC Products Ltd as part of a large manufacturing group can help

AS A PROGRAMMER you will be responsible for the development of our new projects which cover the many interesting applications necessary for our type of business.

We require of you some programming experience in COBOL preferably having used an IBM 370 such as ours.

AS AN OPERATOR under our three shift system we offer you the latest technology using our IBM 370/138 computer. Future prospects include a step to shift leader or a change into programming.

We require you to have operating experience preferably on our type of computer.

We have excellent company benefits including a non-contributory pension scheme, free life assurance, staff discount, subsidised staff restaurant and four weeks holiday.

Why not find out more about us by telephoning, or writing including your C.V. to: Mrs Pamela Bush, Personnel Officer, LRC Products Limited, Sanitas House, Stockwell Green, London SW9 9JJ. Tel: 01-733 7911.

LRC LRC Products Ltd.,

LATENT VACANCIES i.e. JOBS NOT ADVERTISED IN SURREY, SUSSEX MIDDLESEX, BERKS, HANTS

Analysis has shown that jobs advertised by companies are few compared with the total number of vacancies available. Latent vacancies account for the greatest number of jobs available now.

Most companies in these area register their vacancies with our consultancy as we have an established successful record specialising in the recruitment of computer personnel and executives.

We therefore have extensive knowledge of most latent vacancies in the South and South East — the equipment languages salaries and career prospects. We can inform you of vacancies that suit your requirements in the area of your choice.

This free information is just a phone call away. We have done the job-search, you phone us now and take advantage of our services.

Telephone Weybridge (0932) 41321 (Consultants).

ab executive (weybridge) TELEPHONE 0932 41321

Manufacturers and Processors of Industrial Diamond for the World

The Group is in its 10th year of operation, employing over 500 people at Shannon, a town of 8,000 population situated in the Mid-West Region of Ireland where housing and schools are readily available. We now wish to appoint a person to the position of

SENIOR PROGRAMMER

who would have at least two (2) years' experience of ASSEMBLER or RPG II, preferably on IBM 370 hardware. A working knowledge of DOS/VS and CICS/VS and DL/I VS, though not essential, would be a distinct advantage.

The successful applicant will join a software team working on a variety of new and existing commercial applications and will be given training where necessary.

This position carries an attractive salary scale together with a generous bonus and better than average fringe benefits which include a contributory pension scheme, health insurance and life assurance cover.

Please write or telephone for an Application Form before Monday, 23rd October, 1978 to

The Personnel Manager

DE BEERS INDUSTRIAL DIAMOND DIVISION (IRELAND) LIMITED
SHANNON, CO. CLARE. Telephone 061-61[illegible]

CENTRONICS

Centronics, the leading independent manufacturer of matrix printers, requires a European Marketing Communications Executive for our European Headquarters in London

Responsibilities are advertising, PR and shows in Europe. Candidates must be prepared to travel and a foreign language would be helpful, preferably with experience in the PR and advertising world. Experience of the computer industry would be an added advantage

The position will report to the European Marketing Manager. Good salary and fringe benefits commensurate with experience and position. Interviews will be held in London, Paris, Frankfurt or Milan. Please send c.v. in confidence to

Pat Bryer
Centronics Data Computer Ltd.
Petersham House, Harrington Road
London SW7 3HA
Telephone: 581 1011

Simply Better

SYSTEMS MANAGER

Our client is a highly successful and expanding medium-sized company located SOUTH OF BATH.

They are currently seeking a SYSTEMS MANAGER to take charge of the Computer Services Department

The Requirements —

- ★ Educated to at least 'A' level standard.
- ★ PDP and RSIS experience preferably with BASIC+.
- ★ Aged 30+ with good general commercial and industrial experience with a broad base of skills.
- ★ Self-motivated with the ability to communicate with personnel at all levels.
- ★ Enjoy hard work with genuine responsibility.

The Rewards. —

- ★ Salary in the region of £6.5K plus BUPA membership and generous holiday and sick pay entitlements.
- ★ Full relocation to this beautiful part of the WEST COUNTRY with relatively cheap housing.
- ★ Key member of a small department enjoying steady growth.

Please apply in the first instance to. —

Walker Weston Associates Limited
Specialists in Computer Recruitment
Woodlands, Lower Bristol Road, Bath
Avon Tel: Bath 317890

Production Controller

E.C.3. To £5,000

New position — New hardware — Expanding environment

This new position has been created as part of a major expansion plan by our clients DP department. Already a major user of DP they are committed to significant further investment. As a first stage Data 100 terminals have been installed as front end processors to a 370/158.

The successful applicant will be part of a small team — responsible for production control and terminal operations. It will be necessary to liaise with user management and staff as well as the systems and programming groups.

Candidates should have outstanding OS JCL knowledge and a business appreciation. They should have a mature and responsible attitude as this is a critical position within DP.

This is an opportunity for someone to develop with the department's expansion and build a significant career. Our client is part of a major financial group and so as well as a competitive salary, major company benefits apply.

This is an urgent requirement so telephone our CROYDON office NOW or write quoting ref: CW 38.8H.

Computing Services Association

01-686 9693 (24 HOUR ANSAPHONE) | 061 236 9085 FAULKNER HOUSE,
19 PARK STREET, CROYDON, CR0 1TN | FAULKNER STREET, MANCHESTER M1 4ED

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS **CAPP ASSOCIATES** LONDON AND MANCHESTER

KEYMED Specialised Services to Medicine and Industry

IBM SYSTEM 34 PROGRAMMER/ANALYST With experience in RPG II

Mid-twenties/early thirties

£6000-£8000 p.a.

We are equipping our accounts department with the IBM System 34 early in 1979 — we need NOW a Programmer/ Analyst. We are rather special, so why not write now for a company brochure and application form, read about us, return the application form and we'll fix an early interview. You'll lose nothing, but may gain a lot!

The General Manager
KeyMed (Medical and Industrial Equipment) Limited
KeyMed House Stock Road Southend-on-Sea,
Essex SS2 5QH.

PROJECT LEADER

CITY — £9,500

Unique opportunity exists within multi-national communications conglomerate for project leader. A challenging position with responsibility for large team developing major message switch system. Duties will therefore include co-ordination of the team, design of systems and technical guidance to four team leaders. Ideal applicants will have at least five years' experience on PDP, message switch RSX & RTL11 with strong personality and desire to succeed.

- ★ First-class career structure
- ★ Well organised projects and good working teams
- ★ Plenty of room for growth and excellent earning potential

For further details ring or write to:

KNIGHT PROGRAMMING SUPPORT LIMITED
27 NOEL STREET, LONDON, W.1.
01-734 0152/3010, 24 hours

HALTON BOROUGH COUNCIL
Chief Finance Officer's Dept.
Computer Section
Post No. 84

Snr. Analyst Programmer

Grade AP5/SO1—£4,461 p.a.-£5,256 p.a. + £312 p.a.

This post offers a challenging and rewarding opportunity to participate in the development of a new ICL 2904 installation due to be commissioned in the next month. Applicants should have several years' Systems experience using Discs and/or tapes and a programming background that includes COBOL. The positions will involve taking charge of systems from investigation to implementation and negotiating with user department.

This post based Widness and a system of flexible hours is in operation. The council will be willing to pay reasonable removal expenses and make available in appropriate cases accommodation to the successful candidate.

Applications in writing giving details of age, qualifications, experience together with the names and addresses of two referees should be forwarded to, The head of Personnel & Management Services

HALTON BOROUGH COUNCIL
MUNICIPAL BUILDING
KINGSWAY, WIDNES
CHESHIRE WA8 7QS

Closing date 19th October, 1978

Municipal Building
Kingsway
Widnes, Cheshire

R. Turton
Chief Executive

Management Consultants

HONG KONG

As a result of an expansion of our Hong Kong management consultancy practice there is an immediate need to strengthen the team in the management accountancy and data processing areas. We wish to hear from experienced management accountants and data processing personnel who can offer rounded practical experience in developing and implementing a wide range of costing and financial planning and control systems.

Candidates should be in the age range 25-35 and have a professional qualification or university degree.

In addition to a basic salary of not less than £10,000 a substantial accommodation allowance, six weeks annual leave, provident fund and medical expenses will be included in our remuneration package. Present income tax rate 15%, maximum.

Write in confidence, giving fullest details, including a recent photograph, to W. Parker (Ref. MC78/2).

Peat, Marwick, Mitchell & Co.,
Management Consultants,
Prince's Building,
P.O. Box 50, HONG KONG.

Don't let your programming experience gather dust

Your programming experience did not just happen like a bolt from the blue. You have had to work at it . . . so why are you letting it go to waste, when you could be getting more credit for your talents with IAL?

At our offices in West London near Heathrow Airport, we have been working on communications systems for some thirty years.

Currently, we are engaged in a variety of real-time projects based on single and multiple Data General Nova/Eclipse systems, such as computer-aided despatch systems both for this country and overseas. For you, this will not only bring the opportunity to be part of an exciting line of development, but could also mean some overseas travel. All this, plus a salary of up to £6000 and an understanding that programmers with the right ability have every opportunity to progress to more senior positions.

If you have experience with Fortran and multi-programming or multi-tasking on mini-computer systems, come and discuss your ambitions with us. By the way, in addition to a comprehensive benefits package, we can also provide generous assistance with relocation expenses.

Please telephone or write for details quoting ref. no. 498A to The Senior Recruitment Officer, IAL, Aeradio House, Hayes Road, Southall, Middlesex. Tel: 01-574 5134.

IAL **Aviation and Communications Systems and Services—worldwide**

THE UNIVERSITY OF LANCASTER

COMPUTER SERVICES DEPARTMENT

APPLICATIONS PROGRAMMER

A vacancy has occurred in the User Services Section for a programmer to develop and advise on Applications Software for users in the North West Universities Network. A Degree or equivalent qualification is required and preferably some experience of computing in a research environment, possibly as a user. Salary on the scale £3883-£6655.

Further particulars may be obtained (quoting reference L.55/A) from the Establishment Officer, University House, Lancaster, LA1 4YW, to whom applications (6 copies) naming three referees, should be sent not later than 23 October 1978.

FOR CLASSIFIED ADVERTISEMENTS IN COMPUTER WEEKLY

Ring Eddie Farrell or Mark Williams on 01-261 8025
01-261 8019

Documentation Engineers

c. £5,000

Plessey Telecommunications Research at Taplow is currently involved in the development of an advanced processor controlled telecommunications system. An integral part of this development programme is the production and control of documentation which records and details progress to date.

A new team of documentation engineers is to be set up to work closely with the development engineers. The work will allow close involvement with the project and provide considerable scope for increased experience. As well as writing descriptive textual documentation, those appointed will assist in the operation of a documentation control system.

Applicants ideally should have at least 2 years experience of technical writing in either the electronics or computing fields.

The working environment at Taplow is very pleasant, the site occupying parklands on the banks of the river Thames only 35 minutes from central London. Salaries are competitive and there is an attractive benefits package, including generous relocation expenses where appropriate.

For further information and an application form, call Sally Grice on Maidenhead (0628) 23351, or write to her at:

Plessey Telecommunications Research Limited
Taplow Court, Taplow, Maidenhead, Berkshire

PLESSEY telecommunications

Accord Computer Efficiency

Amsterdam based Business Consultant £15,000-£25,000

Accord's business is providing a comprehensive personnel consultancy for clients in Western Europe. This includes:

1 Contract personnel for short/long term assignments
2 Specialist recruitment assignments tailor-made for individual clients
3 Advertising and P.R.
4 Marketing and sales facilities

We now wish to recruit a progressive and successful individual who must have a proven record of significant achievement in at least two of the above areas within the D.P. industry. Our growth to date has resulted in a profitable and highly respected organisation with a secure and established client base.

We intend to include one or two additional consultants who, by their own contribution and involvement in our expansion plans, will benefit not only financially, but by being a vital part of a positive and enthusiastic success story.

A substantial basic salary of about £10,-£12,000 will be negotiated and a commission scheme designed to more than double this income will be discussed.

Our base is in the financial centre of Amsterdam where cost of living is about 40 per cent higher than London, compensated by substantial tax concessions.

Telephone Bill Seymour at your first opportunity for further details and a totally confidential discussion.

Holland Mini Computer Software £16,000+benefits

The consensus of opinion in the computer industry is that Mini and micro-computer systems, during the foreseeable future, will be more widely used and universally accepted in all areas of Computer Technology.

Europe's leading software design and implementation organisation, which has an outstanding reputation in the technical, telecommunication and scientific systems fields wish to recruit a significant number of Programmer/Analysts, Consultants and Senior Consultants experienced in the following

Real-Time Systems
On-line Systems
Message/Packet Switching
Network Design

Conditions of employment and career development opportunities are excellent. Relocation costs will be met by our client. Interviews will be arranged in London during the end of October and beginning of November.

Telephone Bill Seymour on 01-580 3754 for further details in total confidence.

Accord Computer Efficiency Ltd

580 3754

Portland House
4 Great Portland Street
London W1N 5AA England
Tel. 01-580 3754
Telex: 261134

European Office
Sarphatistraat 30
1018 GL Amsterdam
Tel. 020 264664/264082
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SYSTEMS DEVELOPMENT MANAGER

MIDDLESEX

C. £8500 + CAR

Our client, based in Middlesex, is part of a large international engineering and contracting group. A growing area of the group's business is the management of the design and construction of all types of large projects including offshore oil production facilities in the North Sea. These large and complex projects are creating an increasing demand for computer based control and information systems.

The Company is upgrading its existing mainframe computer to an IBM 370/148 before the end of the year with RJE and VDU based access at a number of locations.

The successful applicant will have full project control responsibility including the investigation of user needs and requirements, developing, proposing and agreeing DP solutions and implementing these systems utilising the existing and planned hardware facilities.

All systems and business analysts will report to the development manager who must be capable of technical leadership and man management.

Applicants should preferably be aged between 35 to 45 with a proven record of achievement in the computer systems development field and will have been directly involved in the management of at least one major computer project.

Telephone. 01-839 6087 Bill Taylor

BARNARD DAVIES & WARD LTD 107 Jermyn Street London SW1Y 6EE

THE OPEN UNIVERSITY
STUDENT COMPUTING SERVICE

SHIFT SUPERVISOR

Applications are invited for the post of Shift Supervisor at the University's computer centres in both Milton Keynes and North West London.

The Student Computing Service offers a nationwide timesharing service on DEC-20 and Hewlett Packard 2000 systems based in North West London Milton Keynes and Newcastle upon-Tyne

The Shift Supervisor will be responsible to the Assistant Area Computing Service Manager for the efficient operation of the computer systems during the shift and will be expected to maintain a high standard of advisory support to students and other users. The successful candidate is likely to have previous supervisory experience in computer centres offering a timesharing service

Salary will be within the range £3,084 [illegible] plus membership of the Universities Superannuation Scheme. Two shift working will be required for which an allowance of £345 p.a. will be paid. A London allowance will be paid for the North West London post. The University offers a holiday allowance of 30 days per annum plus one week University closure periods at Christmas and Easter.

Application forms and further particulars are available by postcard request please, from The Recruitment Office (JD3653/), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL or telephone Milton Keynes 63404, there is a 24 hour answering service on 63868.

Closing date for applications 27th October 1978

EQUIPMENT PLANNING ENGINEER

HARROGATE (c£7300+)

Applications are invited for a senior position in the Computer Branch based at the Boards Regional Headquarters, Beckwith Knowle, Harrogate. The Computer Branch is responsible for computing development and production on an ICL 1904S computer, and bears functional responsibility for Regional work on the twin IBM 370/168 installation in London, and for development utilising computers elsewhere in the Region

It is intended within the next 18 months to replace the existing ICL 1904S (192k store, EDS 60s, MT etc) operating under GEORGE III by a current generation system with the capability of supporting a comprehensive communications network.

The Equipment Planning Engineer will lead a section concerned with the development and use of computing equipment and systems software in the Region and will be responsible to the Head of Computer Branch for:

Planning future equipment requirements and the evaluation of appropriate equipment for both central and remote computer installations.

Appraising [illegible] teleprocessing systems compilers and operating systems

Providing functional advice on the selection and use of equipment and systems software to other users of computer equipment in the Region

Applicants should have a degree and/or professional qualification together with several years experience in systems programming and systems evaluation and sizing

The salary will be within the following range: £7,261 p.a. to £8,905 p.a. with possible progression to £9,523 p.a. subject to review. Point of entry will be dependent upon age and qualifications.

Applications to be on standard forms obtainable by telephoning the Recruitment Section (Harrogate 70635) and should be returned to

The Regional Personnel Manager
Central Electricity Generating Board
North Eastern Region, Beckwith Knowle
Otley Road, Harrogate HG3 1PS

to arrive not later than **Tuesday 24 October, 1978.**

Please quote reference **SVN/727/CW.**

Central Electricity Generating Board – North Eastern Region

Department of Management Services

ASSISTANT COMPUTER MANAGER (Ref. M102)

Salary up to £6342 inclusive of supplement

The Borough of Milton Keynes which is located in north Buckinghamshire is one of the fastest growing local authorities in England, and contains within its boundaries the new city of Milton Keynes.

The Council have an IBM System 3 (Model 12) 64K Computer and the successful applicant will be required to design new systems, to develop existing ones and to supervise their programming

The post offers the opportunity for an experienced Systems Analyst to gain valuable and varied experience in all aspects of computer operation. Experience of RPG II Programming would be an advantage.

★ Mortgage facilities available
★ Rented Housing Accommodation
★ 100% removal expenses
★ Assistance with legal fees
★ Lodging allowance

Applications as soon as possible to:

Chief Personnel & Training Officer
Borough of Milton Keynes
SHERWOOD HOUSE, SHERWOOD DRIVE
BLETCHLEY, MILTON KEYNES MK3 6QE
(Tel. Milton Keynes (0908) 71171 ext. 401)

JBA

CAD/CAM Consultant

Holland **c£14,000 package**

This senior position will suit a specialist in computer aided design/management wishing to apply his or her experience and knowledge in a consultancy role. The particular skills required are in the areas of interactive graphics applications, numerical control system design, part production systems and design analysis. Dealing with potential customers and assisting the sales and support teams will be the essential part of the job, as well as advising the programming and design teams.

The successful candidate will have a proven track record in CAD/CAM type development and sales, be a highly personable and presentable individual with a willingness to travel and deal with people at all levels. European language ability an obvious bonus.

Attractive senior staff position offering tremendous scope for creativity, job satisfaction and career development. **Contact: Mike Creamer**

Communications Consultants

Italy **from £12,000**

Our client, a leading European systems consultancy, has opportunities for professional communication specialists to undertake lengthy assignments in Italy.

Candidates must have a sound d.p. background and at least three years experience of communications systems. Knowledge of message switching, distributed systems, HDLC/SDLC, or FEP is essential.

The company offers generous salaries and expenses package, which is negotiable according to experience and assignment, together with the opportunity to work on new technology projects. **Contact: Jim Baker**

Project Manager

London **up to £8,500**

We have been retained by a large manufacturing organisation to recruit a Project Manager to take responsibility for the development of a sales accounting system.

The successful candidate will lead a team consisting of highly motivated professionals. A proven record in project management is essential. Knowledge of IBM, PDP11 or on-line systems would be an advantage. Specific experience of commercial applications is desirable.

This is an opportunity to progress in a well established but dynamic group. Benefits include BUPA and interest free (rail) loan. **Contact: Margaret Stevens**

Project Manager and Sales Engineer

London **c£8,000**

A well established organisation who specialise in computer-based industrial systems has immediate vacancies for both a Sales Engineer and a Senior Project Manager.

Applicants for the sales position must be able to demonstrate a sound background in industrial/process control systems together with an ability to negotiate and close sales in a competitive market.

Since the management vacancy is to control a number of projects, each with its own project leader, candidates should have several years experience in project management and have the maturity and diplomacy to liaise with clients.

Both positions offer excellent salaries which are negotiable but unlikely to be less than £8,000. Large company benefits. **Contact: Jim Baker**

Systems Auditor

London **c£7,000**

One of the leading software houses wishes to appoint a Systems Auditor to undertake the checking and quality assurance of all projects currently being developed by the company.

Applicants should have at least five years experience as a programmer and analyst and fully appreciate the need for project control, standards and technical (as well as time/money) audits in d.p. development teams. This is a London based position but some travel will be essential to visit out of town assignments.

Salary is negotiable according to experience. **Contact: Jim Baker**

Systems Manager

Somerset **£6,500–£7,000**

This highly successful electrical component manufacturer has retained JBA to help recruit a Systems Manager to run their relatively new PDP11/34 installation in Somerset. It is a small and very professionally set up site, running various commercial on-line systems under RSTS/E, using BASIC+ as the programming language.

Ideal candidates will have a good commercial systems background, allied to relevant DEC experience, and be the type who enjoy taking on a great deal of responsibility – involvement with all aspects of the D.P. department's work will be inevitable, in such a small intimate environment.

Apart from the quality of life naturally associated with living in the West Country, the position offers a reasonable salary plus BUPA and a generous holiday entitlement. Relocation expenses will be available where necessary. **Contact: Andy Wright**

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478